U.S. DEPARTMENT OF TRANSPORTATION
OFFICE OF THE CHIEF INFORMATION OFFICER

FY 2003 – FY 2005
PRELIMINARY E-GOVERNMENT AND INFORMATION TECHNOLOGY STRATEGIC PLAN

September 2002

THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

August 30, 2002

MESSAGE FROM THE SECRETARY

The President's Management Agenda highlights the importance of information technologies in making the Federal Government more citizen-centered and results oriented. E-Government is critical to meeting citizen and business expectations for interaction with government and making government more responsive and cost-effective.

The U.S. Department of Transportation Information Technology Strategic Plan provides the blueprint for how the Department will utilize information technologies to support the President's Management Agenda and our overall mission. The Plan identifies both the mission achievement and the management improvement strategies that will support our efforts to meet the transportation systems needs of the future as a unified, efficient "digital department."

As you will see in these pages, we are committed to simplifying delivery of services to citizens, minimizing the burden on the public, and collecting information only once and re-using it. We also will simplify our business processes and utilize information technologies to reduce costs through integrating and eliminating redundant systems.

To achieve this, we will coordinate and collaborate across traditional organizational boundaries to identify ways to use information technologies to improve service delivery to citizens, businesses, and other government organizations, as well as improve our own internal efficiencies and effectiveness. We will ensure that those customers that interact with the Department electronically will do so with the assurance of appropriate security and privacy in their communications. We will also continue to apply rigorous management procedures to ensure we are making sound information technology investment decisions and managing our projects in accordance with government and industry best practices.

I am excited about how our information technology strategies will help us to transform the way we do business at the Department and improve our ability to serve our customers. I look forward to working with you as we bring these strategies to fruition.

Norman Y. Mineta

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EXECUTIVE SUMMARY

The Department's FY 2003 – FY 2005 E-Government and Information Technology (IT) Strategic Plan identifies the strategies and integrated management frameworks the Department will implement to support its strategic goals and the President's Management Agenda. The Plan identifies three guiding principles, five IT strategic goals and associated activities, and enterprise initiatives. The Plan also addresses the major IT management activities the Department will undertake to ensure the strategies are implemented in an efficient and effective manner.

This integrated approach to E-government and IT strategic planning ensures that the Department's investments in IT support our overall E-government efforts to improve services to citizens, simplify business processes, and improve the Department's overall interactions with its customers.

IT Strategic Principles

1. Ensure **alignment** with the President's Management Agenda and the mission-specific business needs of the Department.
2. Ensure **integration** among Chief Information Officer (CIO) functions (such as IT capital planning, IT security and privacy, and Enterprise Architecture (EA)) and with major Federal and Departmental management processes (strategic planning, budget, procurement).
3. Focus on **performance** through establishing appropriate measures for both efficiency (outputs) and effectiveness (outcomes) and managing for results.

IT Strategic Goals

Mission Achievement

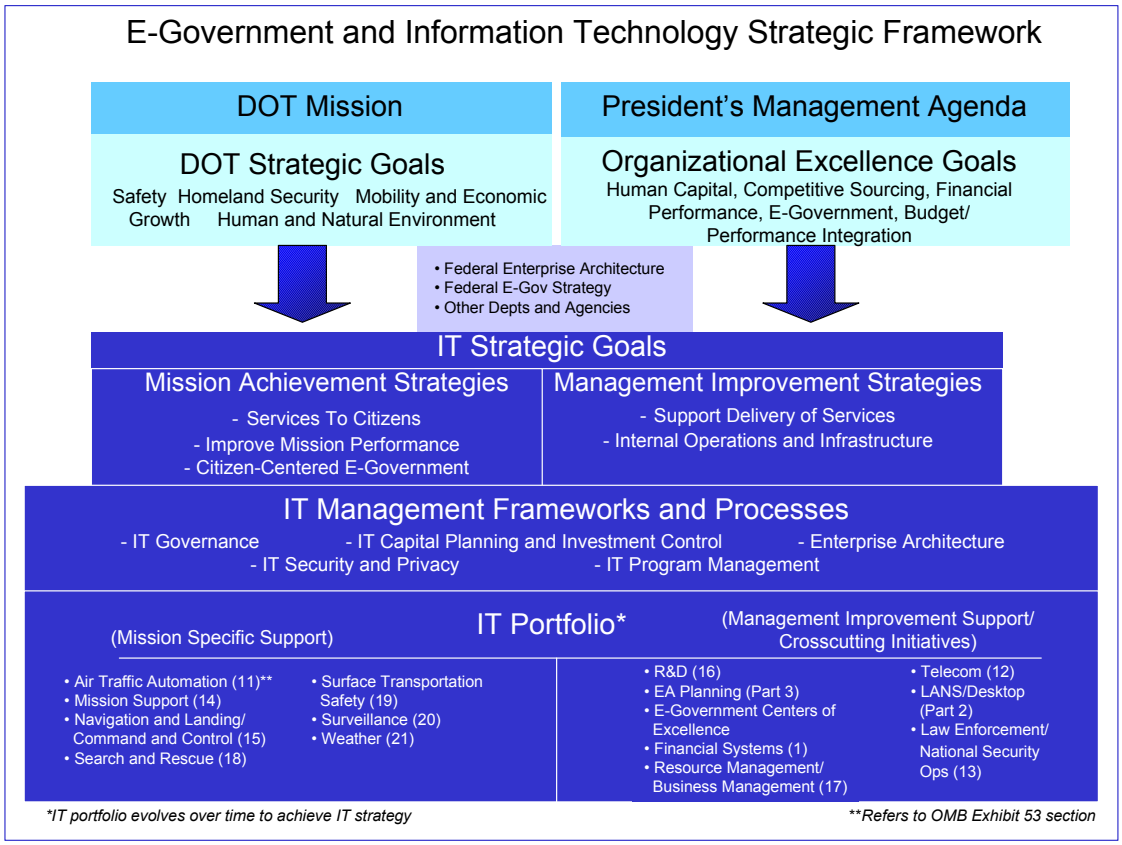
1. Improve services to citizens by leveraging the Federal Enterprise Architecture (FEA) and the Department's EA.
2. Support improved mission performance by enhancing the contribution of information technologies to each DOT strategic goal.
3. Improve customer relationships by implementing a Department-wide, citizen-centered E-government strategy.

Management Improvement

1. Support improved delivery of services to citizens, businesses, and other governmental organizations through continued implementation of comprehensive IT planning and management processes and increased collaboration on E-government projects.
2. Improve internal operations and infrastructure and other "back office" support activities to ensure the Department operates more effectively by continued management of cross-cutting initiatives and enhanced collaboration on E-government projects.

The following figure provides an overview of the Department's E-Government and IT Strategic Framework.

Strategic Framework



This plan will guide IT investment decision-making as well as the overall management of information technologies. It will be finalized contingent upon: 1) revisions to the Departmental Strategic Plan, 2) re-organization activities associated with Department of Homeland Security, and 3) refinements to the FY 2004 budget submission.

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1.0 INTRODUCTION

1.1 Purpose

The Department of Transportation FY 2003 – FY 2005 E-Government and Information Technology (IT) Strategic Plan identifies the strategies the Department will employ to ensure that IT enables the accomplishment of the President's Management Agenda (PMA) and the Department's mission.

This integrated approach to E-government and IT strategic planning ensures that the Department's investments in IT support our overall E-government efforts to improve services to citizens, simplify business processes, and improve the Department's overall interactions with its customers.

1.2 IT Guiding Principles

Throughout this Plan, and the on-going management of information technologies, the Department will focus on the following principles:

1. Ensure **alignment** with the President's Management Agenda and the mission-specific business needs of the Department.

2. Ensure **integration** among Chief Information Officer (CIO) functions (such as IT capital planning, IT security and privacy, and EA) and with major Federal and Departmental management processes (strategic, budget, procurement).

3. Focus on **performance** through establishing appropriate measures for both efficiency (outputs) and effectiveness (outcomes) and then managing for results.

These principles are designed to ensure that the Department approaches IT management in a mission-driven, comprehensive, coordinated, and results-oriented manner.

1.3 The President's Management Agenda

In August 2001 the President's Management Council released the PMA, which identifies the Administration's priorities for improving government performance. The PMA identifies five government-wide initiatives:

- Strategic Management of Human Capital
- Competitive Sourcing
- Improved Financial Performance
- Expanded Electronic Government
- Budget and Performance Integration

These priorities are reflected in the Department's Organizational Excellence strategic goal identified below.

1.3.1 Federal E-Government Strategy: Simplified Delivery of Services to Citizens

In February 2002, OMB issued the Federal E-Government Strategy that presents the Administration's action plan for E-government. The primary goals of the President's "Expanding E-Government" initiatives are to:

- Make it easy for citizens to obtain service and interact with the Federal government;
- Improve government efficiency and effectiveness; and
- Improve government's responsiveness to citizens.

The Federal E-Government Strategy focuses on four citizen-centered groups: 1) Government-to-Citizens, 2) Government-to-Business, 3) Government-to-Government, and 4) Internal Efficiency and Effectiveness. It also identifies 24 Presidential Priority Initiatives (PPIs) designed to significantly improve customer service in an 18 to 24 month period.

1.3.2 Federal Enterprise Architecture

To facilitate efforts to transform the Federal government to one that is citizen-centered, results-oriented, and market-based, OMB is developing the Federal Enterprise Architecture (FEA), a business-based framework for government-wide improvement. The FEA is being constructed through a collection of interrelated "reference models" designed to facilitate cross-agency analysis and the identification of duplicative investments, gaps, and opportunities for collaboration within and across Federal Agencies.

The Business Reference Model (BRM), released in July 2002, is a function-driven framework for describing the business operations of the Federal Government independent of the Agencies that perform them. It contains four business areas, 31 Lines of Business, and 132 Sub-Functions. Ultimately, the BRM will be complemented by a Performance Reference Model, a Data and Information Reference Model, an Applications Capability Reference Model, and a Technical Reference Model. Figure 1 provides an overview of the Federal BRM. Attachment I provides a preliminary mapping of DOT IT initiatives to the Federal BRM.

The Department is currently developing a comprehensive Departmental EA that will document and describe the current organization, business processes, applications, information items, and technology of the DOT enterprise and the relationship among them. The EA will also include implementation plans for moving from the current state to the desired (target) state. The Department will continue to monitor development of the FEA to ensure the appropriate integration among the two EAs. Section 4.4 provides additional detail on the Department's EA efforts.

Figure 1: Federal Business Reference Model

1.4 Alignment of IT with the Department's Mission and Goals

The Department's Strategic Plan sets forth the overall direction, vision, and mission of the Department. The Department will achieve it goals through its leadership in U.S. transportation policy, operations, investment, and research. The highest priority of the Department is to guarantee the safety and security of the traveling public.

DEPARTMENT OF TRANSPORTATION MISSION

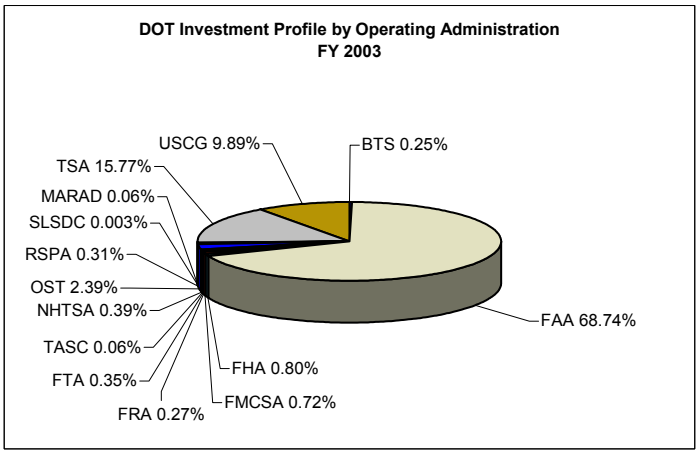
Serve the United States by ensuring a safe transportation system that furthers our vital national interests and enhances the quality of life of the American people

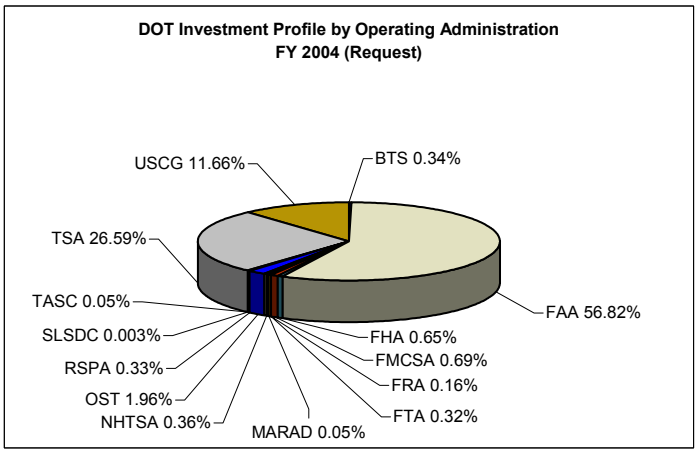
DEPARTMENT OF TRANSPORTATION STRATEGIC GOALS	
Safety	Promote the public health and safety by working toward the elimination of transportation-related deaths and injuries
Homeland Security	Ensure the security of the transportation system for the movement of people and goods, and support the National Security Strategy
Mobility and Economic Growth	Shape an accessible, affordable, reliable transportation system for all people, goods, and regions. Support a transportation system that sustains America's economic growth
Human and Natural Environment	Protect and enhance communities and the natural environment affected by transportation
Organizational Excellence	Implementing the President's Management Agenda by advancing the Department's ability to manage for results and innovation

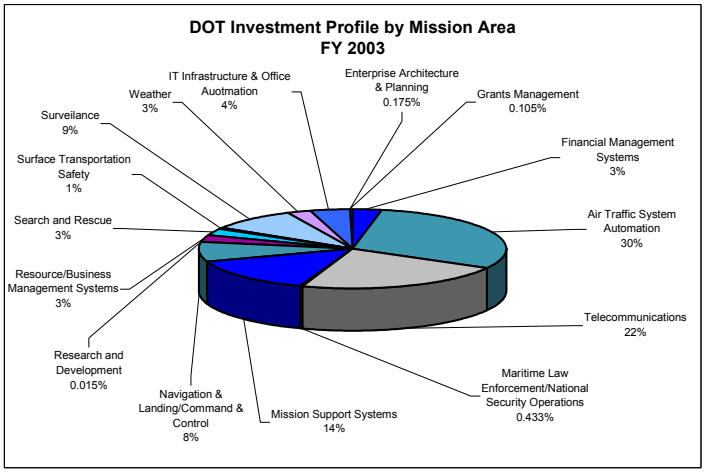
The Department's IT Portfolio

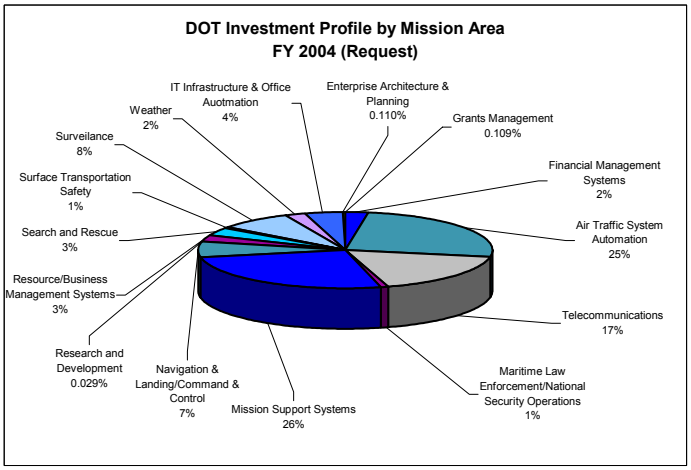
The Department invests over $3.7 billion each year on information technologies to help us carry out our missions and programs. Over 68 percent of IT spending in FY 2003 will be for Federal Aviation Administration programs. The two Operating Administrations (OAs) designated to move to the new Department of Homeland Security--the Transportation Security Administration (TSA) and the U.S. Coast Guard (USCG) --account for over 25 percent of DOT IT spending in FY 2003. Funding for both of these OAs will is expended to increase in FY 2004 reflecting the focus on Homeland Security. The anticipated 12 percent increase in mission support systems funding is also largely due to the increased focus on the roles of the TSA and USCG in supporting Homeland Security. Figure 2 provide a summary of the Department's IT portfolio by Operating Administration and mission area for Fiscal Years 2003 and 2004.

Figure 2: IT Portfolio Views by OA and Mission Area









Section 4.3 of this plan addresses the Department's IT Capital Planning and Investment Control (IT CPIC) process. In FY 2003 the Department will focus on IT portfolio management and will conduct portfolio analysis to ensure IT investments support the Department's strategic framework. The Department will also focus on the diversification of its IT portfolio and seek

opportunities via the Headquarters' move to reduce spending on infrastructure and telecommunications. These efforts will improve our ability to focus on citizen services consistent with our E-government objectives.

FY 2003 Annual Performance Plan

The Department's FY 2003 Annual Performance Plan identifies the near-term information and technology management milestones the Department will undertake to support its mission and strategic goals. These milestones include:

- Complete development of an Enterprise Architecture in FY 2003.
- Implement the IT Capital Planning and Investment Control processes.
- Make progress in inventory actions required by the Government Paperwork Elimination Act (GPEA).
- Meet GPEA requirements to deliver information and transact business electronically by October 2003.
- During the course of EA development, DOT will look at all business processes throughout the Department and identify those that have applicability across multiple organizations. The degree to which existing processes can benefit from increased automation will be factored into proposed solutions.
- Develop IT business case investment information for use in strategic planning, budget formulation, and decision-making. For investments that are critical to achievement of DOT missions, particular emphasis will be placed on providing investment information covering alignment with DOT's strategic goals and the appropriate acquisition, management, and use of such IT capital investments. Also, systems common to multiple DOT organizations that offer the opportunity to achieve significant operational and economic efficiencies through coordination and consolidation of efforts will be identified and analyzed for synergy and efficiencies.
- Reduce information collection burden hours imposed on the public.
  Lead intermodal efforts to ensure the continued security of our transportation information systems to make IT systems less vulnerable to attack and other service disruptions, including those caused by natural disasters.
  - Achieve improvement in Federal classifications for the IT security program
  - Fully integrate IT security into the E-government, IT CPIC, and EA processes
  - Establish standards for authentication and digital signatures (reviewing technologies such as Public Key Infrastructure (PKI) and biometrics) for the Department that contribute to operational and economic efficiencies
  - By January 2003, establish and operate a Department-wide monitoring and reporting capability
  - By January 2003, complete an update of the Department IT security governance structure

- By December 2002, complete the inventory of DOT mission-critical and PDD-63 systems, and develop a plan for the completion of certification/accreditation of those systems by December 2005
- By December 2003, develop a PKI prototype, including digital signature capabilities, for use within the Department

- The Federal Aviation Administration (FAA) has developed a concept of operations, approach, and major milestones to address information security issues and protect information assets. The FAA approach focuses on protecting the operational capability of its facilities, which requires an integrated approach to information systems, personnel, and physical security at each facility. Other efforts to protect both the air traffic system infrastructure and to ensure that new systems incorporate security include:
  - Authorizing and certifying computer security systems
  - Training FAA personnel in security awareness and vulnerability assessments
  - Improving intrusion detection capability

1.5 Current Environment

The Department of Transportation is a technology dependent and information intensive organization, as is the transportation industry as a whole. Information technology is a critical component of air, marine, and surface transportation systems—including those used for traffic control, navigation, search and rescue, and law enforcement. In addition, travelers and shippers rely heavily on information to determine how best to meet their personal and business transportation needs. Key features of the current environment are:

Transportation Security and Safety - In the current environment, the Department must contribute to homeland security by minimizing the vulnerability of our transportation system to disruption, damage, or exploitation through crime or terrorism. Information technology can be used in an effective way to augment and improve traditional physical security checks. The Transportation Security Administration's proposed systems for credentialing and passenger screening are two examples of how technology will be used to fight terrorism in today's heightened environment.

Technology Trends - Key trends influencing the U. S. transportation system include: 1) integration of sensors with computers to create robotic and "smart" vehicles and structures, 2) the growth of electronic commerce, E-government, and web-based communications, 3) the growth of network and information globalization, 4) use of satellites to navigate and communicate; and 5) the merger of voice, video, and data to enable telecommuting and telepresence. In this preliminary E-Government and IT Strategic Plan, we have only begun to address the impact these technology trends will have on the Department. Initiatives such as the Federal Highway Administration's joint program with the States to electronically transfer highway payments, and the National Highway and Traffic Safety Administration's (NHTSA's) ARTEMIS system to electronically collect, monitor, and analyze the car manufacturer defect data are two examples of these newly energizing capabilities.

1.6 Opportunities and Challenges

The U. S. transportation system is vital to our National well-being, whether measured in economic growth, safety, security, international competitiveness, or quality of life. Information technology is a critical enabler for the Department's on-going mission and programs. Understanding the opportunities and challenges posed by this environment is essential to developing successful IT strategies to guide the Department's IT activities of the future.

Opportunities

Improve Service Delivery Through Teamwork and Collaboration – Working across traditional organizational boundaries to better serve citizens is a tremendous opportunity provided by the focus on E-government in the PMA. The Federal E-Government Strategy and the Federal Enterprise Architecture provide the vision and means to support this collaboration to streamline and simplify services, and takes a business rather than an organizational perspective.

DOT Headquarters Relocation - The Department is scheduled to relocate to a new Headquarters building beginning in March 2005. The move to the new location provides an opportunity to consolidate IT systems and services, where appropriate, without sacrificing the DOT mission and accomplishment of strategic goals. It also provides a unique opportunity to modernize the Department's information systems and networks.

Web Services – The Department has the opportunity to expand upon our delivery of services and broaden the communication of DOT policies and programs to citizens, customers, and employees more effectively and efficiently via the Department's Internet and Intranet sites. These opportunities include ensuring a common look and feel to the Department's web sites, consistent use of technology standards, and potential costs savings through avoiding redundancies. The Department is working with the General Services Administration to develop a Transportation Portal within the FirstGov "three clicks to service" architecture. The Federal Aviation Administration is taking a leadership role at the Operating Administration level to consolidate its web services. Finally, all web services activities will be conducted in a manner that ensures IT accessibility standards are met.

Challenges

Culture of Independence - The Department is currently comprised of 13 Operating Administrations and bureaus, each with its own management and organizational structure. There are also legislative restrictions, as with the FAA, that impact the Department's ability to act or manage in a unified manner. Effectively linking the various modes of transportation, as well as meeting the E-government mandate to simplify services to citizens across organizational entities, will require increased levels of coordination and cooperation. The Office of the Secretary is committed to providing leadership to make this happen and all OAs are committed to operating in a unified manner.

IT Workforce Challenges – The ability to recruit, retain, and re-train a skilled IT workforce continues to be a challenge confronting the Federal government. The Department must

determine the human capital requirements needed to ensure our future workforce competency/capability requirements are met and establish robust workforce planning capabilities. The Department is addressing this challenge through its Strategic Management of Human Capital organizational excellence activities.

Ensuring Security and Privacy – The integrity, confidentiality, and availability of information is the basis of maintaining the trust and confidence necessary for successful E-government efforts. There are significant challenges to meeting these security and privacy objectives, including: 1) emerging technologies that do not have effective security, 2) worldwide networks that provide access anytime from anywhere, and 3) a new generation of highly-skilled cyber-criminals. The Department is implementing a comprehensive security and privacy program to address this challenge. The program is addressed in Section 4.0 below.

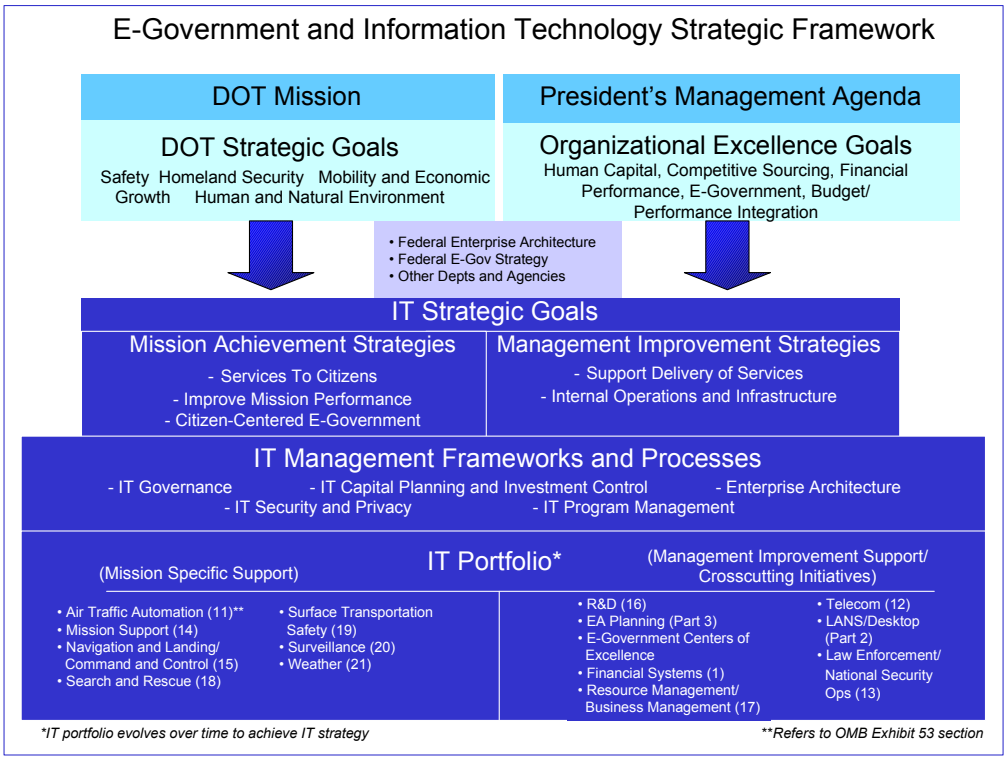
Department of Homeland Security – The creation of the Department of Homeland Security by merging all or part of 22 Federal Agencies is the biggest organizational overhaul in the Federal government since the creation of the Defense Department. Two Operating Administrations, the United States Coast Guard and the Transportation Security Administration, are scheduled to become part of the new Department. To address this challenge, the Department will modify its EA and address support to common customer groups through its citizen-centered E-government strategy. The Department is committed to an on-going IT sharing arrangement with the new Department.

Citizen Involvement in E-government – A key factor in achieving the goals of E-government is to improve services from the customer's perspective, yet privacy and Paperwork Reduction Act requirements often limit the government's ability to obtain critical feedback and performance information from citizens. The Department will work to develop techniques to gain important citizen input into our IT initiatives, as appropriate.

2.0 INFORMATION TECHNOLOGY STRATEGIC FRAMEWORK

Figure 3 provides an overview of the Department's E-Government and IT Strategic Framework. The Framework identifies two sets of IT strategies (mission achievement and management improvement) designed to support higher level Federal and Departmental missions, goals, and strategies.

Figure 3: IT Strategic Framework



Mission Achievement Strategic Goals: These strategic goals and activities focus on alignment of IT to the Department's mission and strategic goals. The primary purpose of these strategies is to improve services to citizens, as defined in the Federal Business Reference Model.

Management Improvement Strategic Goals: These strategic goals and activities focus on alignment of IT to support delivery of services as well as internal operations and infrastructure. These strategies entail the Department's cross-cutting and internal efficiency and effectiveness initiatives.

Both the Mission Achievement and Management Improvement strategies support broader E-government objectives by linking to the Federal Enterprise Architecture and the Federal E-Government Strategy.

Underlying these strategies are the organizational capabilities, processes, and functions performed by the Department to manage its information technologies, including IT governance, the IT CPIC process, EA, and IT security and privacy activities. The Department's IT portfolio is developed within this IT Strategic Framework and managed to support the broader Departmental and IT strategies.

2.1 Mission Achievement Strategic Goals

The Department will pursue the following strategies to support the achievement of the Department's mission:

1. Improve services to citizens by leveraging the Federal Enterprise Architecture and the Department's EA.
2. Support improved mission performance by enhancing the contribution of information technologies to each DOT strategic goal.
3. Improve customer relationships by implementing a Department-wide, citizen-centered E-government strategy.

The key activities, outcomes, and descriptions of these strategic goals are provided below.

MISSION ACHIEVEMENT STRATEGIC GOALS			
No.	**Strategic Goal**	**Key Activities**	**Outcomes**
1	Improve services to citizens by leveraging the Federal Enterprise Architecture and the Department's EA	• Complete Departmental EA by September 2003 • Map the DOT EA to the FEA (ongoing-as both evolve) • Identify shared functions with other Agencies • Identify where DOT does and does not have systems supporting the functions • Identify redundancies and gaps • Prioritize opportunities for collaboration within DOT and with other Agencies • Conduct outreach meetings with other Agencies to develop collaborative approaches	• Simplified delivery of services • Improved citizen satisfaction • Improved integration of data, applications, and technology with the Department's mission, functions, and processes • Reduced costs through integrating and eliminating redundant systems • Minimize the burden on the public • Collect information once, and re-use, as appropriate

MISSION ACHIEVEMENT STRATEGIC GOALS			
No.	**Strategic Goal**	**Key Activities**	**Outcomes**
	Discussion: According to the Federal Business Reference Model, the Department of Transportation supports 21 lines of business and 56 sub-functions in the Services to Citizens Business Area, more than any other Department in the Federal government. The Department has begun mapping of initiatives to the Business Reference Model and will use this analysis to identify opportunities for collaboration and streamlining (See Attachment I). Many of the lines of business--such as Education, Research & Development & Science, and Domestic Economy—are also performed by several other Agencies. The FEA provides the Department with a tool to investigate alternatives to IT investments by identifying: 1) Agencies that are building or have already built similar application capabilities, 2) Agencies that are already collecting or plan to collect similar data, and 3) suitable technologies already being used elsewhere in the Federal government. The Department is already working with other Agencies to improve services to citizens and will continue to identify joint opportunities through the use of the FEA and other collaborative mechanisms. One current example is the Federal Aviation Administration's collaboration with the Air Force on radar acquisitions.		
	Strategic Goal	**Key Activities**	**Outcomes**
2	Support improved mission performance by enhancing the contribution of information technologies to each DOT strategic goal	• Develop IT portfolios for each DOT strategic goal • Conduct portfolio analysis to identify opportunities to contribute to achieving strategic outcomes or reducing costs • Link strategic goal portfolio analysis with DOT EA target business architecture • Conduct Post Implementation Reviews on selected systems supporting each strategic goal	• Improved ability to achieve DOT strategic goals more efficiently and effectively
	Discussion: The Department's Annual Performance Plan identifies the activities the Department will undertake to achieve its five strategic goals and the associated outcomes to be achieved. Information technologies are used by each Operating Administration to support missions and programs. The Department will undertake more rigorous analysis of the contribution of IT to each strategic goal to identify additional opportunities to: 1) support strategic goal outcome achievement, and 2) achieve strategic goals more efficiently.		
	Strategy	**Key Activities**	**Outcomes**
3	Improve customer relationships by implementing a citizen-centered E-government strategy	• Categorize major DOT customer groups • Identify other organizations servicing the same customer groups • Establish pilot projects • Analyze opportunities to improve customer satisfaction and simplify business processes incorporating citizen input	• Improved customer satisfaction • Improved ability for customers to find information and get services from the Federal government

MISSION ACHIEVEMENT STRATEGIC GOALS			
No.	**Strategic Goal**	**Key Activities**	**Outcomes**
	Discussion: The central tenet of E-government is that the Federal government must become more "customer-centric." Being "customer centric" means creating the environment for understanding and improving the customer relationship. The Department will focus on creating value from the citizen's perspective and incorporate citizen input via techniques such as focus groups or usability surveys. The Department has categorized its Government Paperwork Elimination Act (GPEA) transactions into major customer groups. Further analysis and segmentation to target and improve customer service will be conducted by the Department utilizing multiple data sources and leveraging stakeholder relationships via the Business Reference Model. Employing this citizen-centric strategy will enable the Department to target business process improvements to better meet citizen expectations. The Department is committed to better use of IT to enable faster, easier, and more efficient ways for citizens to transact their business with DOT and to provide input on transportation policies and programs.		

2.2 Management Improvement Strategic Goals

The Department will pursue the following strategies to improve the delivery of services:

1. Support improved delivery of services to citizens, businesses, and other governmental organizations through continued implementation of comprehensive IT planning and management processes and increased collaboration on E-government projects.
2. Improve internal operations and infrastructure and other "back office" support activities to ensure the Department operates more effectively by continued management of cross-cutting initiatives and enhanced collaboration on E-government projects.

The key activities, outcomes, and descriptions of these strategic goals are provided below.

MANAGEMENT IMPROVEMENT STRATEGIC GOALS			
No.	**Strategic Goal**	**Key Activities**	**Outcomes**
1	Support improved delivery of services to citizens, businesses, and other governmental organizations	• Continue implementation of comprehensive, integrated approaches to IT planning, including the continued implementation of the IT CPIC process and development of the DOT EA and its use as a management tool • Collaborate with other Agencies on Presidential Priority Initiatives within the support delivery of services FEA business area such as Online Rulemaking, E-Grants, and E-Records • Continue implementation of Section 508 (IT accessibility initiatives)	• Improved IT decision-making and support for DOT missions and programs • Improved inter- and intra-Agency service delivery capabilities • Increased access for persons with disabilities to web sites and E-government applications

MANAGEMENT IMPROVEMENT STRATEGIC GOALS			
No.	**Strategic Goal**	**Key Activities**	**Outcomes**
	Discussion: The lines of business that support the delivery of services include business management of information, regulatory management, planning and resource allocation, Federal financial assistance, IT management, controls and oversight, public affairs, internal risk management and mitigation, and legislative management. The Department leads the Online Rulemaking Presidential Priority Initiative and participates actively in the E-Grants, E-Authentication, and E-Records PPIs. The Department is also implementing a comprehensive IT governance and management framework (See below) that supports the determination of strategic direction, identification and establishment of programs and processes to enable change, and allocation of resources among those programs and processes.		
	Strategic Goal	**Key Activities**	**Outcomes**
2	Improve internal operations and infrastructure and other "back office" support activities to ensure the Department operates more effectively	• Continue identification and management of the internal DOT cross-cutting initiatives to streamline operations, reduce redundancies, and identify cost savings • Collaborate with other Agencies on Presidential Priority Initiatives within the support delivery of services business area such as E-Payroll, and E-Training • Leverage opportunities arising from the planned DOT headquarters move to streamline and consolidate IT services	• More efficient and effective Agency operations • Timely and accurate access to data and information
	Discussion: The internal operations and infrastructure lines of business include human resources, supply chain management, administration, and financial management. The Department is engaged in several Presidential Priority Initiatives such as E-Payroll, E-Recruitment, E-Training, and E-Travel to improve internal operations by leveraging government-wide solutions. The Department is also pursuing several other inter-Departmental initiatives as well as initiatives that cross-cut Operating Administrations. The Department will continue to pursue opportunities for collaboration internally and with other Agencies to improve internal operations and infrastructure.		

These two sets of strategies, in conjunction with the Department's IT Principles of Alignment, Integration, and Performance, will guide the Department's IT activities. Sections 3.0 and 4.0 of this plan identify specific priority initiatives and management capabilities that support these strategies and principles.

3.0 ENTERPRISE INITIATIVES

The Department strives to be a leader in the Federal government in taking a cross-cutting, integrated, streamlined, multi-Agency and enterprise-wide approach to IT management. These efforts highlight the Department's contributions to E-government in developing a 21st century transportation system for all Americans. The enterprise initiatives summarized below are categorized into the following areas:

- Presidential Priority Initiatives

- Multi-Agency Initiatives (other than PPIs)
- Intra-Departmental Cross-Cutting Initiatives

Table 1 provides a summary of the Department's enterprise initiatives and the associated Federal Enterprise Architecture business areas.

Table 1

SUMMARY OF ENTERPRISE-WIDE INITIATIVES			
Category	**DOT Initiative**	**BRM Business Area**	**BRM Line of Business**
Presidential Priority Initiatives	Online Rulemaking	Support Delivery of Services	Regulatory Management
	GeoSpatial One-Stop	Support Delivery of Services	Business Management of Information
	Business Compliance One-Stop	Services to Citizens	Domestic Economy Regulated Activity Approvals
	Disaster Assistance and Crisis Response	Services to Citizens	Disaster Management
	E-Training	Internal Ops/Infrastructure	Human Resources
	E-Authentication	Internal Ops/Infrastructure	Administration
	E-Travel	Internal Ops/Infrastructure	Administration
	E-Payroll	Internal Ops/Infrastructure	Human Resources
	E-Recruitment	Internal Ops/Infrastructure	Human Resources
	E-Grants	Support Delivery of Services	Federal Financial Assistance
	E-Records	Support Delivery of Services	Business Management of Information
	Recreation One-Stop	Services to Citizens	Recreation and National Resources
	Integrated Acquisition	Internal Ops/Infrastructure	Supply Chain Management
Multi-Governmental	E-Collection (Payments)	Internal Ops/Infrastructure	Financial Management
	DOT Interfaces to International Trade Data System	Support Delivery of Services	Business Management of Information
	Credentialing	Internal Ops/Infrastructure	Administration
	Cyberthreat Analysis Cell	Internal Ops/Infrastructure	Administration
Intra-Departmental Cross-Cutting Initiatives	New DOT Building Infrastructure	Internal Ops/Infrastructure	Administration
	Delphi/EHRIS/CHRIS	Internal Ops/Infrastructure	Financial Management

3.1 Presidential Priority Initiatives

Online Rulemaking. As the Managing Partner and government lead in the area of docket management, DOT's experience in transitioning regulatory dockets from paper to electronic and consolidating reading rooms has served as a best practice for the government-wide docket

system initiative. The feasibility of a government-wide electronic docket system has been clearly demonstrated by the operation and lead position of the DOT docket system. Estimated government-wide cost avoidance and savings regarding the unified approach are based upon actual savings achieved by DOT, such as staff reductions of 44% and space reductions of 70%. The technology is in place at DOT and can be scaled to meet government-wide needs.

Without a single, government-wide docket system, the government will needlessly expend over $65 million in development costs and over $30 million annually in operational costs. Without a single, government-wide docket system, the public will not have centralized, electronic access to the vast majority of Federal docketed material, and will not have a simplified portal to search for docketed material across Agencies.

Once a government-wide system is in place, it will cost approximately $19 million annually to operate. Without this system, it is estimated that the 57 regulatory Agencies could expend over $30 million annually to operate separate systems, or over $180 million over six years.

The Online Rulemaking project management team led by DOT will strive to ensure that each phase of the systems development and operations cycles will be performed on schedule and within budget. The team organization will enable the effective management of tasks through the use of appropriate skill sets to complete the tasks assigned to the team. As the program manager we have developed a single, unified business case and shared it with our partners. DOT has requested that this project be funded as a joint business case. To the best of our knowledge, our business partners agree with our recommended approach and business case.

GeoSpatial One-Stop. The long-term vision of Geospatial One-Stop is to revolutionize E-government by providing a geographic component for use in all E-government activities across all local, state, tribal and Federal governments. The Department of Transportation's contribution to the project is fundamental to establishing the groundwork for the long-term vision of the project. The Department's Bureau of Transportation Statistics (BTS) is developing the Transportation data set, which will model the geographic locations, interconnectedness, and characteristics of the transportation system within the United States. DOT is developing Geospatial data that will become the backbone for Homeland Security and government management initiatives across all levels of government.

Business Compliance One Stop. Business Compliance One Stop will help businesses by creating a one-stop point of service web portal for easy access of information about laws and regulations. The site will initially focus on four areas: environment, workplace health and safety, employment, and taxes. The site will also offer wizards and tutorials to help users determine if rules apply to them, including how to proceed. To the maximum extent possible, permits and licenses will be completed, submitted and approved online.

As a participating partner, DOT is out in front of the Federal landscape with the development of one of the first two Business Compliance One Stop portals: Trucking. Motor carrier businesses require specific compliance with Federal and State laws and regulations. As such, the existing Federal Motor Carrier Safety Administration's single portal for processing motor carrier transactions (Do it Yourself/USDOT) has been identified as a best practice. The first version is being produced in collaboration with state partners. DOT is also coordinating with the Treasury

Department to make these government-wide systems, and is using the business case development and analysis process to address this effort.

Disaster Assistance and Crisis Response. Disaster Assistance involves a public, one-stop portal containing information from applicable public and private organizations involved in disaster preparedness, response, recovery and mitigation. The portal will serve as a single point of application for all disaster assistance programs. As a leading provider of disaster assistance, DOT will continue to work with the managing partner (FEMA) to support this critical initiative.

E-Training. The E-Training environment will provide users access to a broad range of content to include topics that are mandatory across government (e.g., computer security, ethics, sexual harassment, etc.), Agency-specific topics (accessible in the portal via a link to the contributing Agency), and softskills-oriented topics. The E-Training instructional delivery system environment will employ a variety of Learning Management Systems to manage the delivery of courses to the end user, collect and disseminate course participation data, and enable links to specific Agency partners.

The Department of Transportation has been a Federal leader in E-Training with the development of Transportation's Virtual University (TVU, www.tvu.dot.gov). TVU serves as the cross-cutting operations partner for the GoLearn initiative led by the Office of Personnel Management. Significantly, TVU has been named as a Best Practice by the Federal CIO Council because of its expertise in E-Training. Additionally, TVU won the prestigious FOSE Excellence in Government Award in 2002. The Federal Highway Administration will coordinate with the Federal GoLearn initiative to facilitate its "E-Learn" initiative as a joint Federal-State program.

E-Authentication. The E-Authentication initiative will provide the secure infrastructure – or gateway – to support the 23 other government-wide E-government initiatives, eliminating the need for each initiative to develop a redundant solution for the verification of identity and electronic signatures. The development of a gateway will allow citizens and businesses to conduct transactions with the government through a single sign-on and will provide a uniform process for establishing electronic identity.

The Departmental business case for E-Authentication takes into consideration the development of the Federal wide E-Authentication solution. DOT intends to capitalize on the Federal E-Authentication project to more cost-effectively build critical E-Authentication capability within the Department. DOT will fully evaluate all alternatives during the planning process in FY2003; envisioning that the project will use a combination of public and private sector sources to fully meet the Departmental requirements for common access architecture services. The E-Authentication initiative is establishing the standards for a Federal bridge to ensure interoperability among the Federal government. DOT E-Authentication will provide the critical infrastructure to take advantage of this capability as well as other public and private sector solutions.

DOT's project will provide the funding and human resources necessary to establish an enterprise-wide, cross cutting common access architecture, to include the incorporation of smart cards, electronic signature, and Public Key Infrastructure (PKI) to improve both physical and logical

access for the entire Department of Transportation. DOT will procure the hardware, software, networks, personnel and services necessary to provide for the generation, production, distribution, control, revocation, recovery, and tracking of smart cards, public key certificates, and their corresponding private keys. This critical project will establish and maintain a common access architecture and associated smart card/Public Key Infrastructure to provide the security services that will enable DOT to conduct E-government transactions with the public and private sector partners as well as with other Federal, state and local government Agencies.

E-Travel. The E-Travel initiative rationalizes, automates and consolidates the Federal government's travel processes in a Web-centric environment, covering all steps from travel planning, authorization and reservations; to travel claims and voucher reconciliation. The Department has taken an active role in the E-Travel business case analysis and development with the Managing Partner for E-Travel, GSA.

The current trend in the private sector is to reduce fees and operational costs and improve performance through the implementation of E-Travel systems. The Department has served as a Federal role model in driving down travel costs with the implementation of an efficient and effective Internet-based travel process Department-wide. E-Travel has been a growing trend, aimed at driving down costs through the implementation of efficient and effective web-based systems. The Department has leveraged a highly successful enterprise wide streamlining solution internally by contracting a cross-cutting Web-Based Travel and Expense (T&E) Service, and by also developing an award winning innovative web-based travel booking system (FedTrip).

E-Payroll. The E-Payroll initiative is designed to standardize, consolidate, and integrate government-wide Federal civilian payroll services and processes through simplifying and standardizing HR/payroll policies and procedures and better integrating payroll, human resources, and finance functions. E-Payroll will establish payroll policies and procedures that will be uniform and easy to understand and administer. The E-Payroll initiative advances the E-government agenda by creating greater efficiencies in Federal payroll processing.

The Department of Transportation has proposed the DOT payroll system (Consolidated Uniform Payroll System - CUPS) as one of the three common payroll systems to be used by the Federal-wide E-Payroll initiative.

A critical element of DOT's financial management strategy is ensuring that payroll integration takes place horizontally with other Departmental financial management systems. Integrating or interfacing all DOT financial related systems will enable DOT to overcome the typical pattern of inefficient, "stove-piped", non-integrated systems.

E-Recruitment. Recruitment One-Stop will improve the process of locating and applying for Federal jobs and expand the functionality of the current USAJOBS automated employment information system. The Department is an active and supportive E-Recruitment partner, posting job solicitations on both DOT's own Internet site and OPM's USAJobs site.

E-Grants. E-Grants is intended to transform the Federal grants environment through a combination of simplification of process, standardization of data, and creation of an electronic storefront. E-Grants will put a single, simple face on the currently complex tasks of finding Federal grant opportunities and applying for Federal grants. E-Grants will create a unified electronic application mechanism for grants, using simplified processes and standard data, which will eliminate redundant, paper-based processes currently required of grant applicants. In addition, E-Grants will associate a single identifier with grant applicant organizations, allowing information about the organization to be collected once and have it included with every application submitted by that organization. By collecting standardized data, including applicant identifiers, into electronic repositories, E-Grants will facilitate the subsequent analysis of grants-related data. Grants are awarded through 26 major "grant-making" Agencies in over 500 programs.

The Department supports and participates in the various interagency grant streamlining committees and work groups and continues to provide key leadership positions in the Federal Grants Streamlining Program that implements P.L. 106-107, the Federal Financial Assistance Management Improvement Act of 1999. The Department has been a lead partner in contributing to the development of key consensus goals among the grant-making Agencies. DOT identified and reported 5 internal E-Grants technologies for potential interagency expansion.

E-Records. This initiative is planned to provide the tools that Agencies need to manage their records in electronic form, addressing specific areas of electronic records management where Agencies are having major difficulties. E-Records will also provide guidance on electronic records management applicable government-wide and will enable Agencies to transfer electronic records to NARA in a variety of data types and formats so they may be preserved for future use by the government and citizens. The vision of the E-Records joint business case is to effectively manage and facilitate access to Agency information in order to support and accelerate decision making and ensure accountability. The Department is a key contributor on this project, working to validate correspondence tracking and transfer requirements for the initiative.

Recreation One-Stop. The Recreation One-Stop initiative involves Internet-based systems that provide information or applications for the public related to recreation, entertainment, vacationing, sightseeing, or related activities. These systems will include recreation-related transaction or reservation systems, and Internet-based recreational mapping systems. The Department of Transportation's Federal Highways Administration (FHWA) scenic byways website, supports DOT's National Scenic Byways Program, providing scenic roadway related information for travelers. FHWA will continue to work with the Recreation One-Stop initiative, enhancing the effort by providing mutual recreation scenic byways links.

Integrated Acquisition. The Integrated Acquisition Environment Initiative (IAE) will deploy a single point of registration and validation of supplier data accessed by all Federal Agencies. IAE will implement a central point for the consolidated collection and the access of statistical and management information related to government acquisitions. The initiative will implement a directory of contracts to simplify the selection and facilitate the leveraging of government buying, reducing the cost of while making transparent the ordering, billing and collections of

intergovernmental transactions. As the Department works to integrate all procurement management processes internally, we will continue to be a proactive partner of the IAE effort.

3.2 Multi-Governmental (other than PPIs)

E-Collection (Payments). A long time leader in bringing E-commerce and E-government together, DOT has pioneered many new and innovative electronic solutions toward creating 21st Century paperless offices. The Department has established an Internet-based payment system, called DIY (Do it Yourself On-Line Payment Site, http://diy.dot.gov) that eliminates the hassle, time, and expense of processing paper forms. What once took weeks now takes mere minutes of a customer's time. In the long term, the Department believes our E-Collection effort is a strong candidate to be included in a joint E-Collections system multi-departmental business case. DIY won the prestigious 2000 Government Technology Leadership Award from the Government Technology Leadership Institute.

DOT Interfaces to International Trade Data System (ITDS). The goal of this initiative is the interface of DOT's border-related IT systems with Customs' ACE/ITDS (Automated Commercial Environment/International Trade Data System). ITDS/ACE is another of DOT's crosscutting information technology initiatives to coordinate, standardize, and ultimately simplify Federal border clearance and other international trade and transportation processes. The goal is to create and implement an integrated, federal system for the electronic collection, use and sharing of international trade and transportation data. When fully developed, ITDS/ACE will be the single electronic portal for all international trade and transportation data collected by Federal agencies with safety, security, admissibility as well as other border missions. By sharing this common information, agencies will be able to target their inspection and enforcement resources more effectively.

Credentialing (Transportation Worker Identification Card). In compliance with the "Aviation and Transportation Security Act of 2001", the Transportation Security Administration (TSA) is taking the lead in implementing a Transportation Worker Identification Card that will impact all Transportation Workers, in all modes of transportation, throughout the United States. This innovative project will utilize smart card and biometric technologies, and will be compliant with both GSA and NIST standards. The systems supporting the card are intended to be interoperable and to provide significant heightened security at all public ports and other transportation facilities throughout the country. In addition to Transportation's coordination with GSA and NIST, this program will be undertaken on a joint basis with the new Homeland Security Department as well as any other Agencies seeking access to public transportation facilities.

Cyberthreat Analysis Cell. The Department intends to collaborate with other Agencies who are implementing technologies to improve their capabilities at intrusion detection, vulnerability testing, and incident reporting/analysis. The FAA has already developed a well-recognized capability in this area. The Department is also coordinating with the Federal Computer Incident Response Center (FEDCIRC) on this issues.

3.3 Intra-Departmental Cross-Cutting Initiatives

Financial Management, Human Resources, Procurement Consolidation (Delphi/EHRIS/CHRIS). Improving financial performance is one of the five government-wide initiatives in the President's Management Agenda and is an area of leadership for DOT. The core of DOT's financial management strategy has two parts. The first part is to complete the implementation of the DOT-wide Financial Management system that uses Oracle Federal Financials software (Delphi). DOT's goal is to be the first cabinet level Agency with all of its OAs on a Joint Financial Management Improvement Program (JFMIP) approved COTS financial management system. The second part of DOT's strategy is to integrate or interface all DOT human resources-related systems into Delphi. The merger of Delphi with EHRIS (Enterprise Human Resource Information System) and CHRIS (FAA's Consolidated Human Resource Information System) will realize this consolidation. This project is a major component of the Department's EA. The program will eventually include extensions for other capabilities including procurement, workforce management, contractor management, and other administrative functions.

New DOT Building Infrastructure. As part of the proposal for the new DOT headquarters building, the CIO organization is proposing a common infrastructure for desktop and server support across all organizations in the new Transportation facility. The goal is to eliminate infrastructure redundancies.

4.0 IT STRATEGIC PLAN IMPLEMENTATION

The Department is implementing a comprehensive set of IT management frameworks and processes to ensure that it achieves its strategies. This section provides an overview of these efforts.

4.1 IT Governance

The Department has established an Investment Review Board (IRB) to serve as an IT project review board for cross-cutting, high-dollar/high-impact, Office of the Secretary, and Transportation Administration Service Center projects. The IRB is chaired by the Deputy Secretary and its membership includes the Chief Financial Officer, Chief Information Officer, Assistant Secretary for Administration, and a representative from the Office of the General Counsel. Associates on the IRB include representatives from Operating Administrations, the Senior Procurement Executive, an IT security representative, and project sponsors and managers.

Operating Administrations also utilize Investment Review Boards to address IT investments and guide the use of information technologies in support of their missions. The FAA has established a Joint Resources Council (JRC), which is the group of Agency senior executives charged with oversight of major capital investments, to improve their oversight of capital and lifecycle investments through the use of best practices in portfolio management.

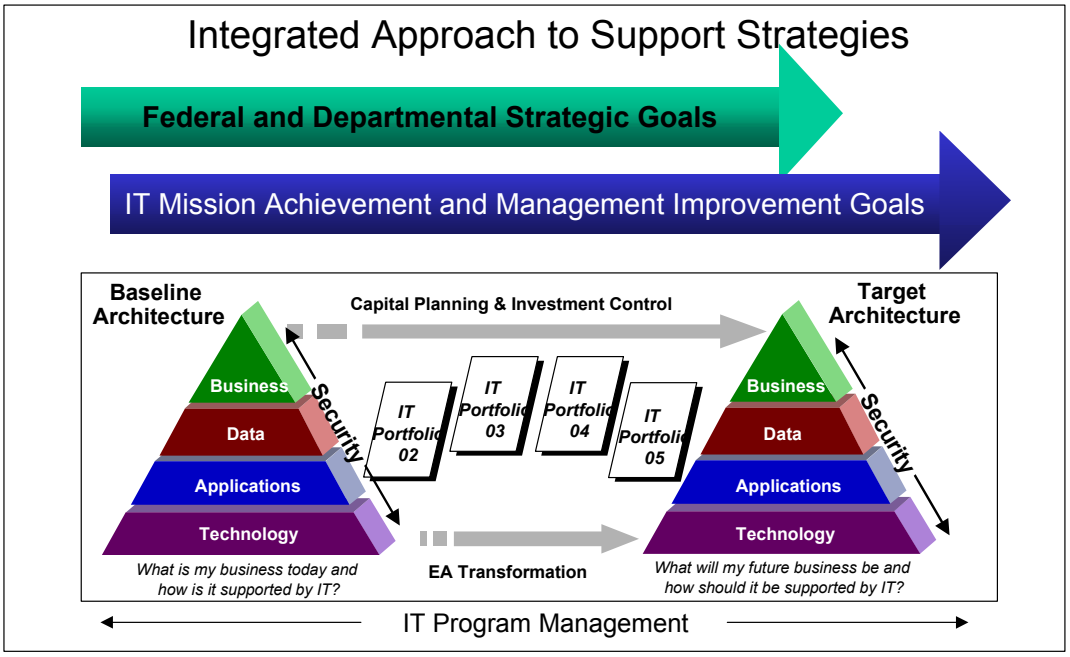
The Department has also established a CIO Council, chaired by the DOT CIO and comprised of the CIOs from the Operating Administrations. The Council meets on a monthly basis to: 1)

collaborate on Departmental IT strategies, management issues, and practices, 2) facilitate discussions on new IT systems and programs, and 3) work together on cross-cutting issues. Subcommittees will be established to address all aspects of the President's E-government strategy.

Through IT governance, the Department ensures the implementation of relevant laws, guidance, and direction. This includes the Clinger-Cohen Act, the Government Paperwork Elimination Act, the Government Information Security Reform Act, OMB Circular A-130 Management of Federal Information Resources, and Section 508 of the Rehabilitation Act. The Department is committed to ensuring its electronic and information technology (EIT) meets the Access Board's standards for providing accessibility to people with disabilities, including both employees and the customers being served, whenever procuring, developing, maintaining, or using EIT.

The IT governance structures will also ensure that the IT management processes implemented by the Department are conducted in a comprehensive and integrated manner. Figure 4 provides an overview of this integrated framework.

Figure 4: Integrated Approach



4.2 IT Program Management

The need for improved management of DOT's 3.7 billion in IT investments requires the implementation of a comprehensive DOT-wide IT program management framework. This framework, which will facilitate better coordination, management, and visibility of IT investments, will be developed using the following five approaches:

Evaluation of Standards and Certification. To ensure guiding principles in the area of IT program management are implemented consistently across the Department, we will identify and

evaluate pertinent industry and Federal standards. The Department will research various certification programs to ascertain the levels of experience needed to successfully manage IT programs. The Department will identify certification programs for training opportunities as well as investigate the prospect of creating a DOT specific certification program. The goal is to create, recruit, and retain a cadre' of personnel resources with strong core competencies in the areas of program and project management with in-depth knowledge and experience in the IT field.

Development of Performance Measures. The Department will develop a framework specifically tailored to building solutions designed to generate measurable business results. For each objective, current baselines and specific improvement targets will be identified. To ensure that new criteria are effectively implemented, performance measures will be used as a gauge to determine program success and to identify areas for improvement. The Department will take into consideration the level of effort needed to implement any identified performance measures as well as determine timelines for implementation. Performance measures identified will complement existing programs within DOT such as the IT CPIC process.

The FAA is creating a "world class" process improvement framework, the FAA integrated Capability Maturity Model (FAA-iCMM), and supporting infrastructure. The FAA-iCMM has been used by many FAA organizations and programs to guide improvement of their management and technical processes, with several organizations having been appraised at Capability Maturity Model Level 2 for the integrated model, and one organization recently reaching Maturity Level 3.

Development of a Resource Strategy. The Department recognizes that a successfully leveraged IT program management framework affects all aspects of DOT's resources. Therefore, the Department will evaluate the effect of any proposed solution on an Operating Administration's staffing and funding. Particular emphasis will be placed on the framework impact on Operating Administrations.

Risk Management. The Department addresses risk management at two levels. At the more global level risk management is addressed within the context of the IT CPIC and address all facets of risks that could impact the success of an IT project. These types of risk include: strategic risk, project management risk, technical risk, development risk, cost sensitivity risk, performance risk, and operational risk. Risk management is also addressed specifically within the context of our IT security program to address system-level risks. In every case, the focus is on early identification of potential risks and development and implementation of risk mitigation strategies.

Information Quality. Information is a critical Departmental resource, second only to human resources. It is vital not only to the Department's daily operations; it is an essential element in fulfilling our mission to ensure the safe, effective, and secure operation of the entire transportation system. Further, in the course of our work, we generate a wide variety of information and information products for public use. Some DOT information products can and do have a clear and substantial impact on important public policies and private sector decisions. The Department has drafted Agency-wide guidelines to establish and apply high standards of quality (objectivity, utility, and integrity) to government information prior to public

dissemination. The guidelines also guarantee affected members of the public the opportunity to request correction of perceived misinformation.

4.3 IT Capital Planning and Investment Control

The Department's IT CPIC process is a yearly cycle that is correlated to the Federal budget cycle. To ensure that CPIC processes are conducted in a sound, business-like manner, and in accordance with broader management process (budget, strategic, and acquisition) requirements, each OA must establish and maintain a process that is consistent with the principles and concepts identified in the Departmental IT Capital Planning and Investment Control Manual. The Department has established Planning, Selection, Control, and Evaluation Phases of the IT CPIC and is focused on reaching higher levels of maturity using the General Accounting Office's Information Technology Investment Management (ITIM) maturity model framework.

To support the Department's IT strategies, the IT CPIC process will ensure that IT investments are closely aligned with our IT strategic goals. The Department will establish IT Portfolios for key customer groups, Presidential Priority Initiatives, and DOT strategic goals. The focus of the IT CPIC activities will be on cross-cutting initiatives to identify opportunities for streamlining, consolidation, cost-avoidance, and cost savings. Importantly, the IT CPIC process provides opportunity for data collection and analysis that can be supportive of E-government, customer improvement, strategy outcome analysis. The Departmental IT CPIC Policy was signed in June 2002 is being implemented in the FY 2004 budget process. Opportunities for process improvements are being identified and revisions will be made in FY 2003 – FY 2005. The policy is provided in Attachment II.

The FAA provides an example of an OA that is establishing a comprehensive IT CPIC process. The FAA will focus on the industry and government "best practice" of IT capital planning and investment control and incorporate that into Agency life-cycle management policies and processes. In particular, the Agency is establishing a capital planning process for significant information technology investments not currently covered under the acquisition management system process. This will greatly improve the quality of the business cases for each major IT investment.

The FAA will organize IT and other related investments into portfolios and select investments by their contribution towards achieving improvements of corporate metrics, including the planned Air Traffic Organization metrics, while balancing risks. As part of portfolio management and capital planning and investment control, the Agency will review investments continuously to manage risks and ensure that benefits are being realized. By leveraging the Enterprise Architecture, the FAA will seek to add value and reduce Agency costs by building corporate systems within the Agency and across the Department, or across multiple government Agencies.

As the Agency that represents the majority of the Department's IT expenditures, the FAA is actively focusing on IT CPIC process improvements. These improvements include redesigning its Investment Review Board, enhancing portfolio management, applying the Integrated Capability Maturity Model to program management, coordinating with the General Accounting Office on process improvement recommendations, incorporating variance tracking and reporting

into the Acquisition Management System, and prioritizing programs to focus management attention.

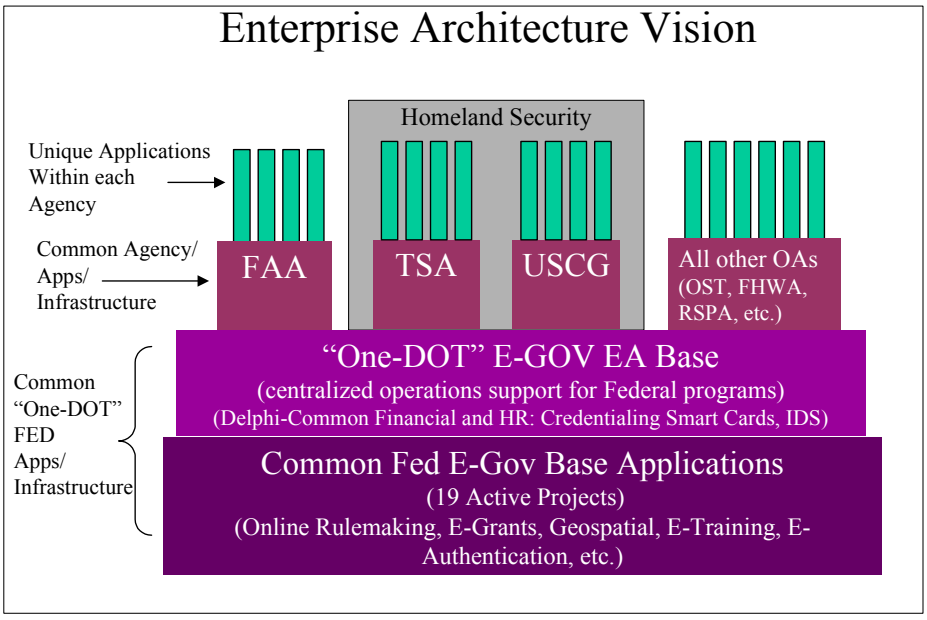
4.4 Enterprise Architecture

The Department's EA strategy covers all business areas of the Department either as a cross-cutting segment that is addressed in the Department-level architecture or as a vertical segment that is addressed in the Agency-level architecture of an Operating Administration. The combination of both cross-cutting and vertical architectures will provide DOT with a comprehensive and workable blueprint to guide future IT investments and manage change at all levels of the Department. This EA will be fully consistent with the Federal CIO Council's Federal Enterprise Architecture Framework (FEAF) and is based on an industry best practice, as identified by GIGA Information Group. The Department expects to complete this effort by September 2003.

The first component of the strategy addresses cross-cutting architectural segments. Using the Spewak methodology embraced by the FEAF, the approach for the DOT EA effort is to develop an architecture whose scope spans all of the Department's OAs, by focusing on architectural segments that are common to two or more OAs. Examples of DOT crosscutting business areas are Financial Management, Human Resource Management, Procurement Management, Counsel, Civil Rights, etc.

The second component of the strategy addresses those architectural segments that are unique to one Operating Administration. These architectural segments or business areas *unique* to a DOT OA will be covered in that OAs EA development effort. These EAs will also be developed using the Spewak methodology and will be compliant with the FEAF. We refer to these unique segments or business areas as "*vertical*" since they are performed uniquely by one DOT OA. Examples of DOT vertical business areas are Air Traffic Services in the FAA, and Search and Rescue in the U.S. Coast Guard. Figure 5 provides an overview of the Department's EA vision. Appendix III provides the Department's EA Project Plan.

Figure 5: EA Vision

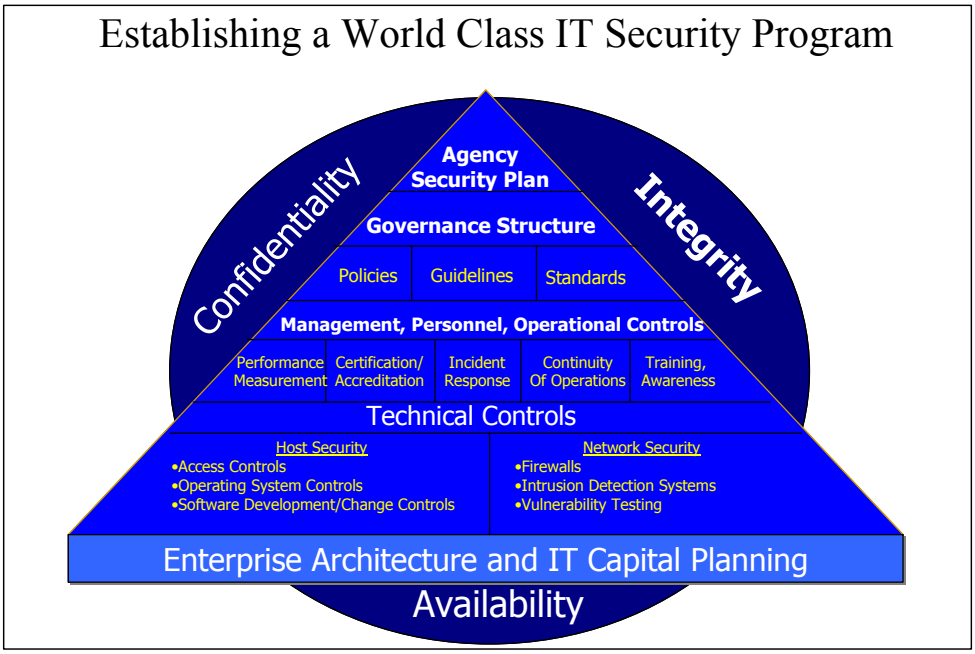


After the Department of Homeland Security is established, the Federal Aviation Administration will be the single largest OA within DOT. The FAA's National Airspace System (NAS) architecture will serve as a major base component of the Department's overall EA. Appendix IV provides an overview of this architecture. The Department's move to a new headquarters' building and the resulting opportunity to consolidate infrastructure operations constitutes a transforming initiative that will be addressed in the Department's EA. Finally, a major cornerstone of the Department's EA will be the financial management, human resources, and procurement consolidation effort currently underway.

4.5 IT Security and Privacy

The Department is committed to establishing and managing a world class IT security program that addresses confidentiality, integrity, and availability of information. To date, the Department has aligned its security program with the President's Management Agenda, integrated with the IT CPIC process and EA activities and has accomplished the following: 1) created and disseminated an Agency-wide security strategy, 2) established an Incident Reporting Program, 3) implemented Pilot Intrusion Detection Systems, 4) established an Enterprise-Wide Vulnerability Scanning License, 5) implemented 80-100% general awareness training, 6) completed 100% specialized training for Departmental Information Systems Security Officers, and 7) conducted System Administrator Training. Figure 6 provides an overview of the IT security program approach.

Figure 6: IT Security Program



Looking forward the Department will focus on the following IT security program elements:

- Implement a Cyberthreat Cell in the Transportation Information Operations Center
- Establish a Department-wide enterprise scanning tool license

- Create minimum acceptable security baselines
- Establish a proof-of-concept Common Access Architecture
- Conduct security compliance reviews including vulnerability scanning
- Improve certification and accreditation of mission critical systems to 50%
- Evaluate all new investment initiatives as part of the Departmental IT CPIC and EA processes
- Fully deploy pilot PKI Infrastructure, Wireless, eAuthentication/eSignature and smart card architecture
- Certify/Accredit 75% of DOT's IT Systems
- Implement Network Intrusion Detection Systems (IDS) Architecture.
- Conduct periodic vulnerability scanning of all mission critical hosts to determine compliance with configuration management/minimum security baselines established in FY2003

IT Security Performance Measurement

In FY02, the Department of Transportation began the first phase of a Department-wide Information Technology Security Performance Measurement Program (IT SPM). The first phase uses the results of the Government Information Security Reform Act (GISRA) reporting process, which established a comprehensive baseline of the current state of the Department's Information Security Program through each reporting administration's Plans of Actions and Milestones (POA&M). This first phase allowed the Office of the Chief Information Officer (OCIO) to familiarize the Operating Administrations with a standardized performance metrics program, using an already mandated reporting process.

The second phase of the IT SPM Program will improve the IT SPM process based on lessons learned from the first phase, and establish more rigorous performance measures that extend beyond measuring compliance with policies and processes to incorporate measures of efficiency and effectiveness. The long-term goals of the IT SPM Program are to:

- Proactively validate DOT security practices and investments
- Provide direction for continuous risk reduction
- Develop and implement a practical and manageable system for gathering data and reporting progress of DOT security program activities
- Continuously address IT security needs in the face of new challenges

In the future the tool supporting the IT SPM Program will be web enabled to allow for easier data entry and collection. Data for the second phase will come from various sources, such as strategic plans, annual performance plans, and future GISRA assessments.

Privacy

The Department of Transportation is committed to respecting citizens' rights to privacy and will protect it as citizens visit our web site. We monitor visits to the web site to identify any attempt to tamper with it. When a citizen submits personal information using our web site we have systems that make sure people outside of DOT cannot access personal information. We would only try to identify a citizen personally when required to do so by a law enforcement

investigation. Any information we collect for those investigations is destroyed according to Federal guidelines. We also will develop privacy impact assessments to address potential privacy implications of the systems we develop and will incorporate privacy considerations into our IT investment approval processes.

4.6 Measuring Compliance with the President's Management Agenda

Provided below is the Department's scorecard for achieving the Expanded Electronic Government initiative in the PMA. These criteria identify the specific activities the Department is currently undertaking to advance its E-government capability, support its E-government and IT strategies, and ensure that the Department "Gets to Green" in a timely manner. The Department's goals are to achieve "green" status on all in-progress activities by September 30, 2002 and all end-state activities by September 30, 2003.

E-GOVERNMENT PERFORMANCE CRITERIA In-Progress
E-Government
• Implement Agency's E-Government Strategy
IT Capital Planning and Investment Control (CPIC)
• Documented CPIC process submitted for OCIO review by 05/31/02 • All major FY 2004 IT investments have a Form 300 business case prepared by 07/31/02 • Implement CPIC processes, starting with Control/Evaluation Phases for existing projects by 09/30/02 • Implement Selection Phase activities for FY 2005 budget submission by 12/31/02 •
Enterprise Architecture
• OA senior management approval of OA EA development plan and budget support by 9/30/02 • All data for "as is" DOT EA submitted by 9/30/02
IT Security
• Plan of Action and Milestones on schedule to eliminate all FY 2001 GISRA weaknesses • Integrate security into the IT CPIC process • All ISSOs and End Users provided awareness by 12/31/02 • Vulnerabilities eliminated on Web Servers in the DMZ by 75% Monthly by 12/31/02
IT Program Management
• IT projects operate within 90% of Form 300 performance requirements (measured quarterly beginning 12/31/02) • Procurement plans reflecting use of enterprise agreements submitted by 9/30/02 • Establish CIO Council committee and define Program Management requirements by 08/31/02
E-Government - General
• Achieve 80% compliance with GPEA by 10/21/02 • Meet International Trade Data System (ITDS) milestone dates
E-Government to Citizen
• Participate in One Stop Recreation initiative & support as requested by lead partner • Submit OA approved 508 compliance plan to OCIO by 9/30/02 to ensure accessibility
E-Government to Business
• Lead govt-wide Online Rulemaking initiative • Participate in One Stop Business Compliance initiative & support as requested by lead partner
E-Government to Government
• Develop draft Geospatial core data content standards for each mode of transportation • Meet DOT commitments to create the National Spatial Data Infrastructure (NSDI) web portal • Participate in E-grants initiative & support as requested by lead partner

E-GOVERNMENT PERFORMANCE CRITERIA In-Progress
E-Government - Internal Efficiencies & Effectiveness
• Participate in E-travel initiative & support as requested by lead partner • Participate in E-Training initiative & support as requested by lead partner • Participate in E-Authentication initiative & support as requested by lead partner • Participate in E-Records management initiative & support as requested by lead partner • Participate in Integrated Acquisition Systems initiative & support as requested by lead partner • Participate in Recruitment One Stop initiative & support as requested by lead partner

4.7 E-Government and Information Technology Action Plan

The following action plan highlights the major activities the Department will undertake from FY 2003 through FY 2005 to implement its E-Government and IT Strategic Plan.

E-GOVERNMENT AND IT ACTION PLAN			
Key Activities	**FY 2003**	**FY 2004**	**FY 2005**
E-Government	• Develop the Department's E-government strategy • Serve as the managing partner for the Online Rulemaking Initiative and oversee the Department's involvement in the President's Management Council government wide E-government initiatives • Meet the Government Paperwork Elimination Act (GPEA) requirements	• Continue to lead the Online Rulemaking initiative and participate in other government wide E-government initiatives • Make improvements to the Department's homepage for the public to make citizen access to information and services easier to find and use • Report on compliance with GPEA requirements	• Continue to lead and participate in government wide E-government Initiatives • Enhance and improve the Department's websites for the public • Improve the Departmental Intranet to provide and effective tool for communicating with employees and doing work electronically
Program Management	• Conduct comprehensive workforce analysis and develop Program Management requirements and implementation plans	• Implement Program Management requirements defined by CIO Council Committee by 11/30/03	• Implement Program Management training course • Implement recruitment and retention strategy
IT Capital Planning and Investment Control	• Complete DOT-wide implementation of the IT CPIC process • Fully operational Departmental Investment Review Board (IRB) to address selected cross-cutting and mission-specific OA investments • Tailor I-TIPS to meet DOT selection, control, and evaluation	• Conduct extensive analysis of IT Investment proposals • Provide full coordination and analytical support to the Departmental IRB • Continue to provide training to the OAs on ITIPS use and OMB Exhibit 300/Business Case requirements	• Achieve full integration of a strategically-oriented IT CPIC process • Analyze business process reengineering possibilities for future substantial changes to IT planning and management within DOT, and provide detailed

E-GOVERNMENT AND IT ACTION PLAN			
Key Activities	**FY 2003**	**FY 2004**	**FY 2005**
	parameters required for program management and monitoring activities • Provide training to the OAs on ITIPS use and OMB Exhibit 300/Business Case requirements	• Conduct full review of OA IT CPIC process implementation • Review and revise DOT IT CPIC policy based on lessons-learned and OMB recommendations	recommendations to senior DOT management • Continue to support already established IT CPIC process training and management requirements DOT-wide
Enterprise Architecture	• Complete DOT "As-Is" EA • Complete DOT "To-Be" EA • Complete DOT Implementation Plan	• Implement EA governance structure • Implement EA Review Board • Develop and execute Telecommunications Infrastructure Improvement Plan	• Continue to execute Telecommunications Infrastructure Improvement Plan • Continue process improvement of the EA Plan
IT Security and Privacy	• Establish standards for authentication and digital signatures (reviewing technologies such as Public Key Infrastructure (PKI) and biometrics) • Establish and operate a Department-wide monitoring and reporting capability • Update of Department IT security governance • Complete the inventory of DOT and develop a plan for the completion of certification and accreditation of those systems by December 2005	• Implement PKI • Expand security architecture improvements • Improve certification and accreditation • Plan to consolidate redundant services in new building	• Expand wireless capability • Achieve 100% certification and accreditation • Implement consolidated services in new building

5.0 SUMMARY

The Department has developed comprehensive IT strategies designed to enable the accomplishment of the Department's mission and the President's Management Agenda. These strategies are designed to ensure the Department contributes to and leverages the broader Federal community resources to improve delivery of services to citizens. The strategies are also designed to ensure that the Department, acting in a unified manner, improves the efficiency and effectiveness of its IT support operations. To implement these strategies the Department has identified specific performance measures and actions plans. The Office of the Secretary will ensure that these implementation activities are conducted in an integrated manner across all major CIO functions and will continue coordination with key oversight entities to ensure the strategies are aligned with the overall Federal direction as it evolves.

The E-Government and IT Strategic Plan will be finalized after key near-term activities have been completed such as the planned revision to the DOT Strategic Plan and the finalization of plans for the Department of Homeland Security.

Attachment I
Initial Mapping to the Federal Business Reference Model

SERVICES TO CITIZENS															
		BTS	**FAA**	**FHWA**	**FMCSA**	**FRA**	**FTA**	**MARAD**	**NHTSA**	**OST**	**RSPA**	**SLSDC**	**TASC**	**TSA**	**USCG**
Consumer Safety															
1.1	Antitrust Control									X					
1.2	Consumer Products QA			X					X		X				X
1.3	Firearms and Explosives Protection				X	X					X				
1.4	Monetary Protection														
Defense and National Security Operations															
2.1	Anti-Terrorism		X	X		X				X				X	X
2.2	Border Control			X				X				X			X
2.3	Intelligence Gathering									X				X	X
2.4	Military Operations		X												X
2.5	Weapons Control														X
Diplomacy & Foreign Relations															
3.1	Conflict Resolution														
3.2	Foreign Socio-Econ and Political Dev.			X		X				X		X			
3.3	Treaties and Agreements	X	X			X				X		X			X
Disaster Management															
4.1	Disaster Monitoring and Prediction	X		X							X	X	X		X
4.2	Disaster Preparedness and Planning			X			X		X		X	X	X		X

SERVICES TO CITIZENS															
		BTS	**FAA**	**FHWA**	**FMCSA**	**FRA**	**FTA**	**MARAD**	**NHTSA**	**OST**	**RSPA**	**SLSDC**	**TASC**	**TSA**	**USCG**
4.3	Disaster Repair and Restore	X		X							X	X	X		X
4.4	Emergency Response	X	X	X	X	X			X		X	X			X
Domestic Economy															
5.1	Business/Industry Development		X	X		X		X		X		X			
5.2	Fiscal/Monetary Control			X											
Education															
6.1	Advising and Consulting	X		X	X		X		X						X
6.2	External Training and Education	X	X	X	X	X		X	X		X		X		X
6.3	Promote Education	X		X	X	X			X		X				X
Energy Management															
7.1	Energy Distribution														
7.2	Energy Production														
7.3	Energy Resource Management			X							X				X
Environmental Management															
8.1	Environmental Monitoring		X	X		X						X			X
8.2	Environmental Remediation		X									X			X
8.3	Pollution Prevention and Control			X			X				X	X			X
Insurance															
9.1	Insurance Issuing														
9.2	Insurance Servicing							X							

SERVICES TO CITIZENS															
		BTS	FAA	FHWA	FMCSA	FRA	FTA	MARAD	NHTSA	OST	RSPA	SLSDC	TASC	TSA	USCG
Law Enforcement															
10.1	Criminal Apprehension									X				X	X
10.2	Criminal Incarceration														X
10.3	Criminal Investigation and Surveillance								X	X	X	X	X	X	X
10.4	Citizen Protection														X
10.5	Crime Prevention														X
10.6	Intellectual Property Protection														X
10.7	Leadership Protection									X			X		X
10.8	Property Protection									X		X	X	X	X
10.9	Substance Control														X
Legal															
11.1	Judicial Hearings				X	X				X	X	X			X
11.2	Legal Defense		X									X			X
11.3	Legal Investigation		X		X	X			X	X	X	X			X
11.4	Legal Prosecution/Litigation		X		X	X			X	X		X			X
11.5	Resolution Facilitation		X	X	X	X			X	X	X	X			X
Marketable Asset Management															
12.1	Financial Asset Management			X								X	X		
12.2	Personal Property Management														X
12.3	Real Property Management														X

SERVICES TO CITIZENS															
		BTS	FAA	FHWA	FMCSA	FRA	FTA	MARAD	NHTSA	OST	RSPA	SLSDC	TASC	TSA	USCG
Public Asset Management															
13.1	Cultural Archives and Artifacts														
13.2	Public Facilities			X			X	X				X	X		X
13.3	Public Funds														X
13.4	Public Records/Data Management			X							X	X	X		X
Public Health															
14.1	Illness Prevention														
14.2	Immunization Management														
14.3	Public Health Monitoring	X		X											
Recreation and Natural Resources															
15.1	Conservation Planning			X											X
15.2	Public Land and Monument Management			X								X			X
15.3	Tourism Management			X								X			
Regulated Activity Approvals															
16.1	License Issuance and Control		X												X
16.2	Permit Issuance and Control		X								X				X
Research & Development and Science															
17.1	Data & Statistics Development	X	X	X	X		X		X		X	X			X
17.2	Scientific R&D	X			X						X				X

SERVICES TO CITIZENS															
		BTS	**FAA**	**FHWA**		**FRA**	**FTA**	**MARAD**	**NHTSA**	**OST**	**RSPA**	**SLSDC**	**TASC**		**USCG**
17.3	Socio-Economic R&D	X		X	X	X					X				
17.4	Technology R&D	X	X	X	X	X	X				X			X	X
Revenue Collection															
18.1	Debt Collection														
18.2	Tax Collection														
18.3	Other Revenue Collection											X			
Social Services															
19.1	Burial Services														
19.2	Community Development			X											X
19.3	Food Assistance														
19.4	Housing Benefits														
19.5	Medical Services														
19.6	Monetary Benefits														
Trade (Import/Export)										X					
20.1	Export Promotion					X						X			
20.2	Merchandise Inspection								X						X
20.3	Tariff/Quotas Monitoring								X						X
20.4	Trade Law Enforcement								X						X
Transportation															
21.1	Air Traffic Control		X												X
21.2	Land Transportation			X	X	X	X		X		X				
21.3	Maritime Transportation							X			X	X			X
21.4	Space Operations		X												

SERVICES TO CITIZENS															
		BTS	FAA	FHWA		FRA	FTA	MARAD	NHTSA	OST	RSPA	SLSDC	TASC		USCG
Workforce Management															
22.1	Job Creation			X						X		X	X		
22.2	Labor Rights Management			X			X			X		X	X		
22.3	Worker Safety			X		X				X	X	X	X		X

SUPPORT DELIVERY OF SERVICES

			BTS	FAA	FHWA	FMCSA	FRA	FTA	MARAD	NHTSA	OST	RSPA	SLSDC	TASC	TSA	USCG
Business Management of Information																
23.1	Information Collection		X	X	X	X	X	X	X	X	X	X	X	X	X	X
23.2	Information Sharing		X	X	X	X	X	X	X	X	X	X	X	X	X	X
23.3	Record Retention		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Controls and Oversight																
24.1	Corrective Action		X	X	X	X	X	X	X	X	X	X	X	X	X	X
24.2	Program Evaluation		X	X	X	X	X	X	X	X	X	X	X	X	X	X
24.3	Program Monitoring		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Federal Financial Assistance																
25.1	Grants Assistance		X	X	X	X	X	X	X	X	X	X				
26.2	Loan Assistance						X		X							
26.3	Subsidies															
IT Management																
27.1	Lifecycle/Change Management		X	X	X	X	X	X	X	X	X	X	X	X	X	X
27.2	System Development		X	X	X	X	X	X	X	X	X	X	X	X	X	X
27.3	System Maintenance		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Internal Risk Management and Mitigation																
28.1	Contingency Planning		X	X	X	X	X	X	X	X	X	X	X	X	X	X

SUPPORT DELIVERY OF SERVICES															
			BTS	FAA	FHWA	FMCSA	FRA	FTA	MARAD	NHTSA	OST	RSPA	SLSDC	TASC	TSA	USCG
28.2	Continuity of Operations		X	X	X	X	X	X	X	X	X	X	X	X	X	X
28.3	Service Recovery		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Legislative Management																
29.1	Legislation Testimony		X	X	X	X	X	X	X	X	X	X	X		X	X
29.2	Legislation Tracking		X	X	X	X	X	X	X	X	X	X	X		X	X
29.3	Proposal Development			X	X	X	X	X	X	X	X	X	X		X	X
Regulatory Management																
30.1	Policy and Guidance Development		X	X	X	X	X	X	X	X	X	X	X		X	X
30.2	Public Comment Tracking		X	X	X	X	X	X	X	X	X	X	X		X	X
30.3	Regulatory Creation		X	X	X	X	X	X	X	X	X	X	X		X	X
30.4	Rule Publication		X	X	X	X	X	X	X	X	X	X	X		X	X
Planning and Resource Allocation																
31.1	Budget Execution		X	X	X	X	X	X	X	X	X	X	X	X	X	X
31.2	Budget Formulation		X	X	X	X	X	X	X	X	X	X	X	X	X	X
31.3	Capital Planning		X	X	X	X	X	X	X	X	X	X	X	X	X	X
31.4	Enterprise Architecture		X	X	X	X	X	X	X	X	X	X	X	X	X	X
31.5	Project Planning		X	X	X	X	X	X	X	X	X	X	X	X	X	X
31.6	Strategic Planning		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Public Affairs																
32.1	Communications and Outreach		X	X	X	X	X	X	X	X	X	X	X	X	X	X
32.2	Customer Services		X	X	X	X	X	X	X	X	X	X	X	X	X	X
32.3	Product Marketing		X	X	X	X	X	X	X	X	X	X	X	X	X	X
32.4	Public Relations		X	X	X	X	X	X	X	X	X	X	X	X	X	X

INTERNAL OPERATIONS/INFRASTRUCTURE

INTERNAL OPERATIONS/INFRASTRUCTURE															
		BTS	FAA	FHWA	FMCSA	FRA	FTA	MARAD	NHTSA	OST	RSPA	SLSDC	TASC	TSA	USCG
Administration															
33.1	Facilities, Fleet and Equipment Mgmt.	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33.2	Help Desk Services	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33.3	IT Infrastructure Maintenance	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33.4	Security Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33.5	Travel	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33.6	Workplace Policy Development and Mgmt.	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Financial Management															
34.1	Cost Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34.2	Financial Reporting	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34.3	Funds Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34.4	General Ledger Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34.5	Payment Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34.6	Receivable Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Human Resources (HR)															
35.1	Advancement and Awards	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35.2	Benefits Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35.3	Labor Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35.4	Payroll Management/Expense Reimbursement	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35.5	Resource Training and Development	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35.6	Security Clearance Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35.7	Staff Recruitment and Employment	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Supply Chain Management															

INTERNAL OPERATIONS/INFRASTRUCTURE															
			BTS	FAA	FHWA	FMCSA	FRA	FTA	MARAD	NHTSA	OST	RSPA	SLSDC	TASC	TSA	USCG
36.1	Goods Acquisition		X	X	X	X	X	X	X	X	X	X	X	X	X	X
36.2	Inventory Control		X	X	X	X	X	X	X	X	X	X	X	X	X	X
36.3	Logistics Management		X	X	X	X	X	X	X	X	X	X	X	X	X	X
36.4	Services Acquisition		X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Attachment II
Department of Transportation
Information Technology Capital Planning and Investment Control Policy

U.S. Department of Transportation

Information Technology (IT) Capital Planning and Investment Control (CPIC) Policy

CPIC Manual

TABLE OF CONTENTS

1.001 Introduction

Information Technology (IT) Capital Planning and Investment Control (CPIC) implementation is mandated by the Clinger-Cohen Act of 1996 (CCA). This Act, among other things, requires heads of Federal agencies to link IT investments to agency strategic goals and accomplishments and to establish a disciplined capital planning process to oversee the management of these investments. The December 12, 2000 revision to Office of Management and Budget (OMB) Circular A-130, Management of Information Resources, provides guidance relative to the implementation of CCA provisions covering IT investments. Also, the Government Information Security Reform Act (GISRA) of 2000 prescribes requirements for the proper handling and management of security for IT assets.

1.002 Purpose

This Information Technology (IT) Capital Planning Manual ("Manual") provides policy and guidance for the Department of Transportation (DOT) and the DOT Operating Administrations (OA)* regarding the planning for, selection and management of, IT-related investments. In this Manual, the term "IT investment" is used synonymously with the term "IT project" or "IT asset". The Manual conforms to Federal law** and guidance and sets out a process allowing for planning, selection, control and evaluation of DOT's IT capital assets in a manner fully consistent with strategic planning, enterprise architecture, project management, budget, acquisition process and security considerations. As discussed under "Review Organizations", the Manual provides for the establishment of a Departmental Investment Review Board (IRB) to provide oversight for: (1) "cross-cutting" projects common to two or more DOT organizations, (2) single organization mission-specific projects having either sufficient dollar value, DOT mission criticality or public visibility to merit consideration by the Departmental IRB, (3) Office of the Secretary (OST) projects, and (4) Transportation Administrative Service Center (TASC) projects. Notwithstanding the responsibilities of the Departmental IRB, the OAs will be fully responsible to establish and implement their own local IT CPIC processes in accordance with the concepts set out in the Manual, and establish local IRBs (or equivalent bodies) for review and decision-making for projects for which they have responsibility. The OAs will retain decision-making authority for all projects which do not come under the purview of the Departmental IRB.

1.003 Implementation Requirements

The Department will fully implement an IT CPIC process, conforming to the principles set forth in this Manual, in accordance with the following schedule (events should occur earlier, if possible):

- OAs develop local IT CPIC processes and submit them to the DOT Office of the Chief Information Officer (OCIO) — June 28, 2002
- DOT OCIO completes reviews of local IT CPIC processes (in collaboration with Offices of the Chief Financial Officer — August 30, 2002

(CFO) and Senior Procurement Executive (SPE)) for general compliance with the concepts set out in this manual

- Project Control/Evaluation activities begin — September 30, 2002
- Project Selection activities begin — January 31, 2003

* OA *refers to the 3 DOT entities: Office of the Secretary (OST), Bureau of Transportation Statistics (BTS) and Transportation Administrative Service Center (TASC), and the eleven (11) operating administrations [Federal Aviation Administration (FAA), Federal Highway Administration (FHWA), Federal Motor Carrier Safety Administration (FMCSA), Federal Railroad Administration (FRA), Federal Transit Administration (FTA), Maritime Administration (MARAD), National Highway Traffic Safety Administration (NHTSA), Research and Special Programs Administration (RSPA), Saint Lawrence Seaway Development Corporation (SLSDC), Transportation Security Administration (TSA) and the United States Coast Guard (USCG)].*

** *All recommendations and requirements contained in this manual are applicable to the FAA, to the extent that such requirements and recommendations are consistent with the express language contained in 49 U.S.C. 106, 4011, 40121.*

1.004 Applicability

Figure 1., below, summarizes the classifications and characteristics of the IT Capital Investment categories covered by this Order. Note that capital planning information will need to be entered into the Information Technology and Investment Portfolio System (ITIPS) database for all IT projects with total life cycle costs (LCC) of $1 million or more, or for mission critical IT projects with total LCC of less than $1 million . Such information should be updated on a regular basis following project selection. "Major" projects shall be updated, at a minimum, at least twice a year. See 1.012 for the description of ITIPS.

Figure 1. - IT Capital Investment Categories

Classification	Characteristics
Major	Major projects require generation and submission of an OMB Exhibit 300 report (Capital Asset Plan/Business Case) annually, and typically have one or more of the following characteristics: • Life-cycle costs equal to or greater than $150 million and less than $1 billion • Critical to the administration of DOT projects, finances, property, or other resources • DOT Secretary/OA Administrator priority • Required by law
Significant	Significant projects typically have one or more of the following characteristics: • Life-cycle costs equal to or greater than $50 million and less than $150 million • Projects that have technical, operational, architectural, or political impact
Small / Other $1 million or Above	Small /Other projects have the following characteristics: • Life-cycle costs equal to or greater than $1 million and less than $50 million • Special political or operational interest
Small/Other Below $1 million	• Life-cycle costs less than $1 million Typically not to be subject to the DOT IT CPIC process unless the project is identified as being mission critical (See Appendix 3, Glossary.).

Note: The DOT Office of the CIO and the DOT Office of Budget and Programs may designate projects as "Major", "Significant", and "Small/Other" in collaboration with cognizant OAs.

1.005 Manual Format

The format of this Manual is designed to explain general DOT IT CPIC concepts and provide implementation guidance for use by the OAs in establishing compliant IT CPIC processes (as listed under 1.004). The Manual allows for the development and use of local processes that will be flexible enough to accommodate the unique missions, organizational structures, management practices and business requirements of each organization.* This Manual provides those who are charged with carrying-out the process with straightforward guidance, examples and templates on how to design and execute such delegated IT CPIC activities. The expectation is that each OA process implementing this manual will articulate necessary details on conducting and documenting the process within that OA (including the establishment and use of strategic evaluation criteria specific to that OA and reflecting the principles laid out in Appendix 7, Recommended Strategic Evaluation Criteria. The goal of the integrated IT CPIC process is to invest in IT assets that align with DOT and OA mission goals, improve business processes, provide adequate security and result in the best use of resources.

**All recommendations and requirements contained in this manual are applicable to the FAA, to the extent that such requirements and recommendations are consistent with the express language contained in 49 U.S.C. 106, 4011, 40121 .*

Pursuant to Federal law and guidance cited in Appendix 9, References, this Manual's IT CPIC-related policy will:

- Ensure that DOT IT-related capital investments are directly linked to the accomplishment of DOT/OA missions, strategic goals, and business objectives
- Ensure that IT CPIC, budget and acquisition processes are properly linked/coordinated
- Ensure that Enterprise Architecture and Security considerations are given proper emphasis in the IT CPIC process
- Ensure that DOT makes sound IT-related investment decisions based on thorough project planning, risk identification, and resource management
- Delegate to the head of each OST Office and OA the responsibility for coordinating respective IT project approvals through that organization's IRB
- Enable DOT management to identify opportunities for consolidating requirements and investments affecting multiple OAs ("cross-cutting" projects) to increase interoperability (most "cross-cutting" projects will be identified during the development of the DOT-wide Enterprise Architecture (EA))

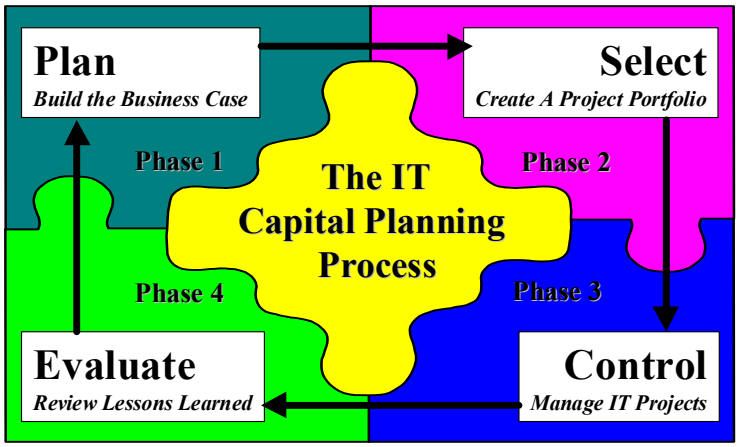
1.006 DOT IT CPIC Process Overview

The DOT IT CPIC process is a yearly cycle that is pegged to the Federal budget cycle. To ensure that CPIC processes are conducted in a sound, business-like way, and in accordance with cyclical (e.g., budget , strategic, and acquisition) planning requirements, each OA must establish and maintain a process that is generally consistent with the principles and concepts contained within this manual for purposes of addressing that OA's mission specific projects. Some OAs (such as the FAA with its Acquisition Management System (AMS) and USCG with its System

Acquisition Manual (SAM)) have already established robust processes, which, though still subject to OCIO review and recommendations, substantively address the requirements of this manual. The remaining OAs will need to take steps to establish local processes with regard to the schedule laid out under 1.003. The OCIO will be responsible to establish and maintain a process guiding the activity of the Departmental IRB with regard to cross-cutting, selected mission-critical, OST and TASC projects.

The first two CPIC phases ("Planning" and "Selection") are closely related as their functions are designed to identify, screen and choose for inclusion in the budget process, projects that match requirements and available resources. It is important to remember, however, that the Planning Phase focuses on documenting IT project requirements, while the Select Phase focuses on choosing projects that are affordable, and support strategic goals and core business processes. IT CPIC Planning Phase activities can occur at anytime throughout the year, as IT project requirements are identified and Business Cases are developed for either Departmental or OA IRB review (See 1.007.). As most Federal spending on projects is based on fiscal year spending, the majority of IT CPIC Select Phase activities will be handled on an annual basis through Departmental or OA IRB meetings in February/March, or at another appropriate time. At these meetings, IT projects for the next one or more fiscal years will be reviewed and recommended for consideration in the budget cycle. Selection decisions made at the Departmental IRB and the OA IRBs will be reflected in the annual DOT budget submission that is prepared. The "Control" Phase serves to oversee the implementation of selected projects, and the "Evaluation" Phase is a lessons-learned and feedback process that affects the other three CPIC Phases. Control and Evaluation Phase activities tie more closely to the accomplishment of project milestones, which will be addressed through periodic Departmental and OA IRB meetings. All of these IT CPIC activities are best accomplished through a cooperative effort between project offices, the Chief Information Officer (CIO), the Chief Financial Officer (CFO), and the Senior Procurement Executive (SPE) staffs (and their OA equivalents). See Figure 2., "Phases of IT Capital Planning."

Figure 2. Phases of IT Capital Planning



1.007 Review Organizations

IRBs (or equivalent bodies) will be established at the Departmental and OA levels, and IRB activity will be conducted in accordance with local processes established by each OA (as indicated in "DOT IT CPIC Process Overview" above). The purpose of each IRB is to serve as the principal forum for conducting formal IT CPIC activity such as: (1) review of Business Cases , (2) prioritizing and selecting projects for initial or continued inclusion in the budget process, (3) controlling and managing ongoing projects, and (4) reviewing and acting on the results of Post Implementation Reviews (PIRs) of completed projects.

This document establishes the Departmental IRB that will be responsible for overseeing the following actions:

- "Cross-cutting" projects common to two or more DOT organizations (such as e-mail, payroll and personnel-related projects). The main venue for identifying "cross-cutting" projects will be the Enterprise Architecture (EA) process.
- Single organization mission-specific projects having either sufficient dollar value, DOT mission criticality or public visibility to merit consideration by the Departmental IRB*
- OST projects
- TASC projects

1.008 Responsibilities

The Departmental IRB will consist of the following, who will have primary responsibility for the activities listed (recognizing that the Chair, membership, and associates should have inputs into all aspects of IRB deliberations):

Chairperson – The Deputy Secretary or his/her designee:

- Establishes and focuses on Departmental priorities in accordance with the DOT Strategic Plan, mission needs, the DOT IT Architecture, and the budget
- Sets the Departmental IRB agenda and designates projects for review
- Consults with Departmental IRB members on decisions to select new projects, or to continue, modify or terminate ongoing projects*
- Considers PIR results in formulating Departmental IT investment activity
- Ensures that key program leadership roles (e.g., project manager) are adequately established and addressed

Members – DOT Chief Financial Officer (CFO):

- Provides budgetary perspective and status on individual projects
- Ensures that cost/benefit analyses, return-on-investment and other financial analyses provided on projects are appropriate and valid

- Renders opinions regarding overall affordability of specific projects, as well as collective portfolios of projects
- Examines and analyzes all relevant budget and financial management considerations and provides budget information to Departmental IRB Chair and members

DOT Assistant Secretary For Administration :

- Provides management perspective and status on individual projects
- Ensures the development and use of appropriate project performance measures
- Renders opinions regarding the overall approach of specific projects, as well as collective portfolios of projects

**All recommendations and requirements contained in this manual are applicable to the FAA, to the extent that such requirements and recommendations are consistent with the express language contained in 49 U.S.C. 106, 4011, 40121 .*

DOT Office of The General Counsel:

- Provides advice and guidance regarding the legal sufficiency of all aspects of each project
- Provides legal assistance and support as necessary (e.g., acquisition protests)

DOT Chief Information Officer (CIO):

- Serves as expert advisor to the Secretary on IT-related matters concerning ongoing or prospective IT investments
- Assures that individual and collective IT investments provide for the critical mission needs of DOT, and that strategic planning, technology, EA, and security issues are adequately addressed
- Ensures the development and use of appropriate project performance measures
- Provides leadership for DOT IT CPIC process development, implementation and maintenance
- Provides review of OA IT CPIC processes, and ongoing oversight of OA IT CPIC processes
- Maintains the IT Investment Portfolio System (ITIPS) database containing technical, schedule and budget information on IT projects DOT-wide
- Identifies cross-cutting IT projects (common to two or more DOT organizations) for inclusion in ITIPS and review by the IRB

Associates - Cognizant Head of Operating Administration (OA) or Designee:

- Acts as advocate of project(s)
- Provides strategic rationale and explanations for projects to Departmental IRB Chair, membership and associates

Senior Procurement Executive (SPE):

- Ensures that acquisition strategy considerations for each project are documented and appropriate
- Ensures that Business Cases are consistent with DOT acquisition policies and procedures
- Advises the project manager, project sponsor and the Departmental IRB with regard to the appropriateness of contract type(s) and approaches to be used

DOTAssociate CIO, IT Security:

- Ensures that IT security objectives are considered, and met, in all phases of the DOT IT CPIC process.
- Ensures that IT security funding is defined in the Business Case and is included in budget cycle considerations
- Provides IT Security expertise to Departmental IRB and project management
- Ensures safeguards are integrated into systems as per Security Plans

Cognizant Project Manager And/Or Sponsor:

- Provides technical expertise and rationale to support the project
- Has primary responsibility for Business Case preparation during the Planning Phase
- Manages and monitors the project during the Control Phase
- Assesses project success during the Evaluation Phase
- Ensures each system receives security accreditation before it is implemented

Others as needed:

- For additional technical, budgetary, legal, security, logistical, architectural or scheduling information

Departmental Capital Planning Working Group (CPWG):

- Provides staff support for the Departmental IRB and typically is drawn from the DOT Office of the CIO (OCIO), and will include advisors with architecture, technical, contractual , budget, and security expertise. However, staff support may be drawn from other OA organizations as available, and as necessary.
- Provides advice and guidance as needed to project managers and sponsors regarding the identification of new projects, as well as concerning the preparation of Business Cases for new and ongoing projects.
- Takes principal responsibility for the identification of both “cross-cutting” and OA mission-specific projects to be reviewed by the Departmental IRB.*
- Screens completeness and adequacy of project Business Cases and supporting documentation in terms of technical, schedule, budget, risk,

security, mission need, strategic, architectural alignment and other considerations prior to going before the Departmental IRB for review.

- Coordinates overall Departmental IRB activity and scheduling, and assures that appropriate materials are prepared and assembled for projects to be reviewed by the Departmental IRB.
- Uses the IT Investment Portfolio System (ITIPS) database (See 1.012.) as a primary source of project planning and status information.

As part of development and implementation of OA IT CPIC processes, each OA will need to establish and operate a local OA IRB (and supporting group similar to the CPWG) with similar constituent membership, roles and responsibilities. Each OA will have the latitude to structure its IRB to reflect its internal organization, IT architecture, staffing, security procedures and particular methods of operation.

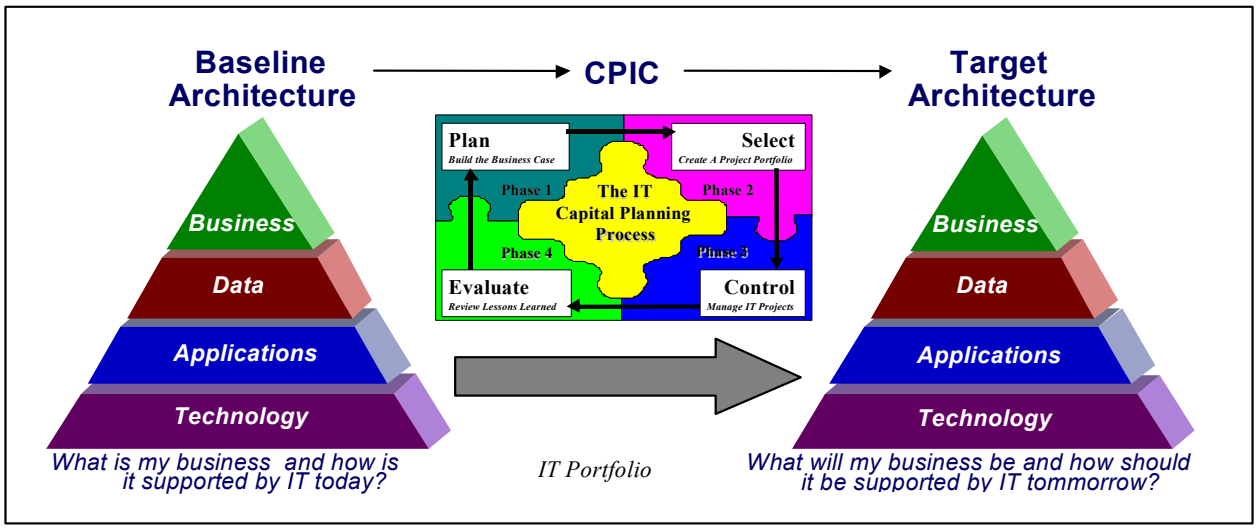
With the exception of the Departmental IRB established within OST to provide coverage of cross-cutting, OST, TASC and selected mission-critical projects*, all OA IRBs will be responsible for overseeing and making decisions for their own OA mission-specific projects.

**All recommendations and requirements contained in this manual are applicable to the FAA, to the extent that such requirements and recommendations are consistent with the express language contained in 49 U.S.C. 106, 4011, 40121 .*

1.009 Enterprise Architecture

Enterprise Architecture (EA) is the information repository that defines current and future business and technology environments for DOT. An EA provides detailed perspectives of the organization's business process, data requirements, application suites, and technical infrastructure. EA "alignment" for IT projects begins in the CPIC Planning Phase. During this phase, IT project sponsors (PS) and project managers (PM) must ensure that their project proposals document the project's alignment with the DOT and OA EAs. During the CPIC Select Phase, IT Business Cases – defined in Section II and Appendix 1 -- are screened, reviewed and scored for the same type of alignment. During CPIC Control Reviews, the architectural aspects of a project are reviewed again to ensure that any technical aspects of the project that may have changed since the last review are in alignment with mission objectives, the DOT EA, and the OA EA. A formal configuration management system should be implemented. This process also verifies that any change in the DOT and/or OA target architectures is updated within the Business Case. The DOT EA will serve as the main utility to identify “cross-cutting” IT projects with commonality to two or more OAs. Figure 3. illustrates the relationship of the CPIC process to the EA process.

Figure 3. The Relationship between Capital Planning and Architecture



1.010 IT Security

Full participation in project security planning and implementation is a key component of the DOT IT Security Program, established May 1, 2001, which implements the Government Information Security Reform Act (GISRA) of 2000.

It is important that DOT and OA CIOs and their Security staffs be active participants in each organization's applicable decision-making and acquisition processes (See Appendix 2., Security During IT CPIC Phases.), to ensure that salient IT security considerations are properly emphasized and closely managed for the total life cycle of each project. The goal is to ensure that IT security requirements are built into each system. All CIOs and Information Systems Security Officers (ISSOs) should participate to address and resolve security issues early, to ensure that the Certification and Accreditation process is undertaken for each project. Specific security costs for each project, with supporting detail, should be captured and included in the Business Case and Security Plan.

Fully attending to security matters up-front and across the life cycle of each project can yield significant benefits by avoiding the need to undertake costly security retrofits as a result of security shortfalls found after project inception. This will help DOT to: (1) improve the overall coordination and management of IT security efforts; (2) reduce overlap among IT security programs; and (3) improve the ability to clearly articulate IT security needs and plan for required personnel and specific IT budget resources.

1.011. Risk Assessment and Mitigation

Within any IT project initiative lies inherent risk stemming from the combination of technical, operational, financial or organizational dynamics. A Risk Assessment template should be completed within the Planning Phase to mitigate any significant negative portfolio performance. The project sponsor or project manager should monitor and assess the various risk categories to identify those strategies that are on target with established goals and those which are not. See Appendix 5 for sample Risk Assessment and Mitigation Worksheets. These worksheets can be used to derive a simple numeric risk indicator which, when combined with other numeric risk indicators, can provide a picture of the overall performance of risk assessment and mitigation efforts for the project.

Strategic Risk – A measure of compatibility against existing business goals and processes
Project Management Risk – An overall logistical scorecard, which reports individual project timeline/goal adherence and size
Technological Risk – Measures technological alignment and integration with DOT enterprise architecture standards and processes
Development Risk – A general development/acquisition indicator, which measures the testing, documentation and evaluation risk of new technologies and/or approaches.
Cost Sensitivity Risk – Scores project cost elasticity
Performance Risk – Measures attainability of initial project requirements and goals
Operational Risk – A technical indicator that measures security and system interdependencies

1.012 Information Technology And Investment Portfolio (ITIPS)

ITIPS is a government-owned, developed and supported information repository tool that is used throughout the IT CPIC process to strengthen and support an organization's IT planning. Required information on all IT projects with total life cycle costs of $1 million or above is required to be included in the ITIPS database (See Figure 1.). Such information should be updated on a regular basis following project selection (during the annual budget data call and at other times). Major projects shall be updated, at a minimum, at least twice a year. IT projects with total life cycle costs under $1 million are typically not required to be included in ITIPS unless the project is identified as being mission critical (See Appendix 3, Glossary.).

ITIPS supports all phases of the capital planning process. ITIPS is a web-based Internet or Intranet application that may be integrated into any network environment. It offers a "point and click" environment that delivers up-to-date IT investment information. Along with other project costs, specific security costs are broken out and reported for each project under the heading "Life Cycle Cost Information", and the subheading "General Financial Information." Total security dollars are reported, as well as the completion date, or planned date of security certification and accreditation of each project.

The system is tailored to DOT standards, and generates OMB required reports. These reports are:

- Exhibit 300: Capital Asset Plan/Business Case and Justification (same information as Business Case)
- Exhibit 53: Agency IT Investment Portfolio

During annual budget data calls in May/June of each year, CIOs will take the lead in working with project managers (PM), budget office and procurement office personnel to generate OMB A-11 Exhibit 300s for projects contained within the "Major" IT Investment Category, as per Figure 1. The 300s will be generated from information required to be entered into ITIPS (for all IT projects with total life cycle costs (LCC) of $1 million or greater, or for mission critical IT projects with total LCC of less than $1 million) . The entire investment portfolio is then compiled by the OCIO into the reporting requirement called Exhibit 53 and provided to OMB as a draft Exhibit 53 in September. All Exhibit 300s are also provided to OMB at that time through the OCIO. After the November passback, a final Exhibit 53 is provided to OMB in January of the following year.

The I-TIPS system administrator in each organization is responsible for working with the PM to coordinate the preparation of Exhibit 300s for all major projects to ensure standardization and accuracy, prior to submission to the Office of Management and Budget (OMB) through the OCIO.

1.013. Planning Phase

The CPIC Planning Phase focuses on building a standardized Business Case to support the implementation of IT requirements. In general, DOT classifies all capital investments (projects) as "Major", "Significant", or "Small/Other", based on criteria relating to project size, cost, mission criticality, and sensitivity. The CIO at the DOT or OA level should work with the DOT or OA Project Sponsors and other executives to identify the appropriate investment category for the project prior to a Select Phase review. More information on the three IT capital investment categories is provided under "Applicability" in Section I.

IT project planning ensures that only viable, well-considered initiatives are forwarded to the for CPIC Select Phase review, followed by funding and inclusion in the DOT or OA investment portfolio. Work on the development of a Business Case begins as soon as the need for an IT project is identified, and entails coordination with the Office of the SPE (or local procurement official as appropriate) to develop a preliminary acquisition strategy, as well the Office of the CFO (or local budget official as appropriate) to address needed levels of funding.

Planning Phase Steps	**Responsibility**
1. Identify IT Project Requirements	Sponsor/User
2. Complete Project Proposal	Sponsor/User
3. Assign Qualified Project Manager/Support Staff	Sponsor
4. Complete a Business Case, including:	
a. Performance Measures (Figure 4.)	PM/CIO/Users
b. Budget and Procurement Discussions	PM/Sponsor/CIO

Step 1: Identify IT Project Requirements
The first step in the CPIC Planning Phase is to identify a supportable IT-related business need and a sponsor for the project. Project Sponsors include executives, line managers, existing project managers, and others who would most likely champion the resourcing and implementation of a valid requirement. Pre-screening of the project at this juncture is often conducted with personnel from budget, acquisition and project management. Step 1 activity is often verbal and determines answers to questions such as "What is the requirement?", "Who does it help?", "When is it needed?", "Where does it fit with existing or planned systems?", "Who would implement and operate it?", and other general questions that serve to eliminate weak Business Cases before they consume too much of the staff's resources.

Step 2: Complete Project Proposal
The second step of the Planning Phase centers on developing and pre-screening a preliminary project proposal. The Project Sponsor, with assistance from those who originated the requirement, prepares this proposal documenting the project's scope and requirements. The preliminary project proposal should address the proposed project's alignment with strategic goals, acquisition strategy, architecture alignment, affordability, and overall priority relative to other potential projects.

Step 3: Assign Qualified Project Manager/Support Staff
Generally, if it is determined by appropriate management officials that the requirement is valid, the PS identifies a prospective PM and support staff with an appropriate mix of education and experience to develop a full Business Case discussed in Appendix 1 and to manage successfully any resulting project work . The PM is responsible for guiding all work on the project as it goes through system life cycle development and CPIC reviews.

Step 4: Complete Business Case
Once named, the PM can organize project information into a standard Business Case format containing the key elements, as shown in Appendix 1 (modeled after the OMB Exhibit 300). Generally speaking, the Business Case addresses the project description, funding, mission need, acquisition strategy, alternatives analysis, risk, EA, security, and establishment of performance goals. For each project (irrespective of its Major, Significant or Small/Other status), the Business Case information should be included in the Exhibit 300 format in ITIPS in accordance with the Appendix 1 template instructions.

The Appendix 1 template can be adapted for a wide variety of projects with the understanding that larger projects will require more detailed documentation and analysis to determine whether or not the project meets the IT capital investment screening criteria established by the Departmental or OA IRB. Other key Business Case components addressed in the appendices are the Cost/Benefit Analysis (CBA) (Appendix 4) of the project, Risk Assessment and Mitigation Worksheet (Appendix 5), and an approach for tracking the planned versus actual expenditure of resources for the project (Earned Value Management – Appendix 6). The completed CBA, Risk, and EVM templates become part of the Business Case. Following project selection by the Departmental or OA IRB, Business Case data should be updated regularly.

4a: Identify Project and System Performance Measures

The PM should facilitate the development of a list of performance measures applicable to the project, which will serve to determine if the system meets expectations for performance, cost, and schedule. Such performance measures should be designed to reflect the particular acquisition strategy for each project (e.g., modular contracting, evolutionary acquisition concept, etc.) and should define applicable project phases and milestone reviews. The initial collection of performance measures forms a baseline that will be maintained to measure progress and status through the life cycle of the project. Appendix 6, Earned Value Management, explains how the performance measures defined can be used to measure actual achievements against those identified at project inception (in the Business Case). Examples of performance measures are given in Figure 4.

Figure 4. Broad Examples of IT-Related Performance Measures

Categories of Performance Measures:

- **Overall Customer Satisfaction and Perceived Value of IT svcs.**
- **Resource Outputs/Outcomes: Process Efficiency in terms of reduced costs, cycle times, reduction of full time equipment**
- **Internal Measures of Quality of Products/services**
- **Timeliness of Delivery & Schedule Variance**
- **Return on Investment and Cost Variance**

Typical Performance Measures:

- **Response Time**
- **Mean Time Between Failures**
- **Availability/Run Time**
- **Ease of Navigation/Use**
- **Customer Support Responsiveness**
- **Effectiveness of Training**
- **Accessibility**
- **Data Integrity**
- **Rate of Use**
- **Scalability And Portability**
- **Data Confidentiality**
- **Cost Control**

4b. Begin Budget and Procurement Discussions

As part of the Business Case's development, initial cost estimates are derived for the project. These estimates are then used as a starting point in the planning process. These financial estimates can then be informally reviewed by the DOT or OA CIO, budget, and procurement

offices. The intent is to promote dialogue among the various groups to determine if the proposed project could be financially viable. This is also an opportunity to determine what possible sources of funding could support the project, including when the funding could become available. Finally, coordination with the procurement office is an opportunity for the project manager to determine the most appropriate contractual approach for the project (i.e., does the project warrant a fixed price contract, a cost plus fixed-fee contract, etc?).

1.014 Select Phase

The objective of the CPIC Select Phase is to determine which IT projects to submit into the budget process for funding. During this phase, strategic, architectural, operational, and political priorities are matched against Business Cases to facilitate decisions for funding projects that will begin one to two years in the future. Select Phase Reviews will be conducted by the Departmental IRB or OA IRBs in February/March of each year to ensure that the most viable projects are included in the Departmental and OA IT portfolios, to the extent that funding allows.

CPIC Select Phase activities consist of four main steps identified in the box below:

Select Phase Steps	Responsibility
1. Screening a Project	CPWG (or equivalent)
2. Scoring and Ranking Projects	IRB
3. Selecting Projects for Investment	IRB
4. Control Phase Preparation	IRB/PS/PM

Step 1: Project Screening (As Needed)
The principal objective of screening the Business Cases is to rapidly determine whether or not a project is properly documented and supported before either the Departmental or an OA IRB's time, effort, and resources are spent in reviewing it. The Business Case should contain the relevant technical, schedule, cost and other information required for initiatives that are candidates for review. During this step, the Departmental or OA CPWG makes an initial assessment if an appropriate level of analysis and documentation has been, or could be, completed. In accomplishing this step, all IT projects are screened by the Departmental or OA CPWG against pre-determined general criteria. This is to determine whether the candidate project meets basic requirements covering areas such as strategic alignment, architectural alignment, mission need, affordability, security requirements, technical standards, project management and support, and disabled access requirements. Screening is performed using the required Business Case information that has been loaded by the Departmental or OA PM into the ITIPS database. Following screening, the Departmental or OA CPWG either recommends a project for inclusion in the Selection process, or will notify the Departmental or OA PM that deficiencies have been identified in the Business Case. The PM can correct the deficiencies, cancel the initiative, or make alternate plans.

Those projects determined to be adequately documented and supported will be placed into the appropriate DOT or OA "Investment Pool" in the ITIPS database. Movement of such project information into a DOT or OA "Investment Pool" will be done by authorized individuals (often the Departmental or OA PM), and with database privileges provided by the DOT OCIO. Withdrawn initiatives will not be placed in an investment pool, but may be retained within ITIPS for future consideration or review. Placement within either a DOT or OA investment pool means that a project is now ready to be considered for actual Departmental or OA IRB selection and recommendation for funding. Projects placed within investment pools move into the part of the Select Phase, where a more comprehensive and rigorous method of scoring will be applied. At this juncture, the Departmental or OA CPWG is also responsible for identifying any "cross-cutting" initiatives not already included in available EA information.

An example of "Recommended Strategic Investment Criteria" is listed in Appendix 7. These criteria are to be used as a guide for both screening by the Departmental CPWG or OA CPWGs, as well as for scoring and selection of projects by the Departmental IRB or the OA IRBs. OA IRBs may adjust the criteria as necessary to meet their unique needs in terms of business requirements, legislative mandates, and lessons learned.

Step 2: Project Scoring
IT Projects that have been screened and determined to be adequately documented and supported are then scored by the Departmental IRB or OA IRBs against detailed criteria such as mission alignment, EA alignment, Return-on–Investment, risk, security, business process improvement, project management and support, etc. The scoring criteria are designed to help quantify the characteristics associated with IT projects to draw uniform comparisons. This methodology assigns numeric values to IT projects based on a set of criteria and associated weights. The weighting of criteria allows Departmental or OA IRB decision-makers to emphasize and prioritize selection factors. Both the weighting and scoring rules can be adjusted as needed.

Departmental or OA IRB members (and/or staff) score each project and document their rationale or justification for the scores provided, any relevant observations, and feedback for use by the PMs. The quality ratings are then used for project viability comparisons and are incorporated into the Select Phase decision-making process.

Analysis of the results of the scoring process is not the sole basis for Select Phase decision-making purposes. Scored projects are given final prioritization based on a combination of calculated Business Case scores as well as other factors including criticality, political sensitivity, budget, strategy, project health, and mission contribution.

Step 3: Project Ranking And Selection
Each IRB's final selections concerning projects are reflected in the final IT Investment Portfolio set. The Departmental IRB or OA IRBs consider additional factors when making selection decisions by reviewing scoring results, considering overriding factors (legal mandate, operational criticality, political sensitivity, security arrangements, funding availability, etc.) and asking questions such as:

- Do projects and portfolio reflect DOT and OA strategic goals and objectives?
- Have potential funding constraints been identified and considered?
- Is the portfolio positioned to help accrue the greatest ROI?
- Is the portfolio positioned to advance towards the transitional or target enterprise architecture?
- Have the ramifications for decisions not to invest in certain projects been given full consideration?
- Have opportunities to invest in crosscutting initiatives been appropriately evaluated?

The Departmental IRB Chair or each OA IRB Chair documents project selections and decisions resulting from the deliberations of the Departmental IRB or OA IRB. Copies of this documentation are to be provided to the following Departmental or OA officials: CIO, CFO and procurement.

Step 4: Control Phase Preparation
At the conclusion of the CPIC Select Phase all selected projects are referred to the budget process to obtain necessary funding. Funded projects are retained in the ITIPS database portfolio to prepare for the CPIC Control Phase. Portfolio areas can be tailored to reflect the priorities and areas of interest in IT investment for each organization. Examples of IT Investment Portfolio areas include IT infrastructure, office automation systems, financial systems, operational systems, human resources systems, grants administration, and IT service-level agreements. Unsuccessful or unfunded projects that continue to merit consideration may remain in the DOT or OA ITIPS Investment Pool for future Select Phase Reviews.

1.015 Control Phase

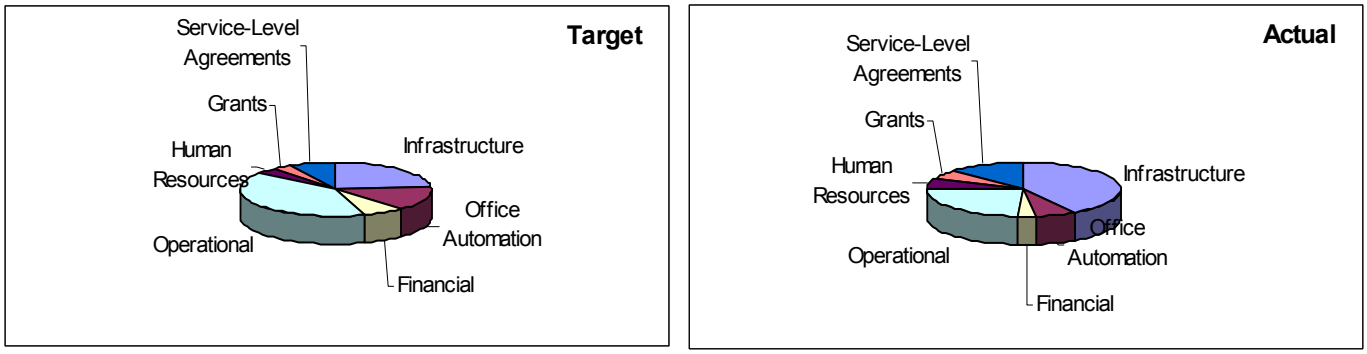
The CPIC Control Phase is designed to provide independent project oversight in the areas of cost, schedule, performance, and risk. This is accomplished through semi-annual control reviews conducted by the Departmental IRB or OA IRBs (e.g., Acquisition Reviews (AR) in the case of the FAA). These reviews embody the implementation of Federal law and guidance that require each agency to ensure that IT investments are managed wisely and that intended capabilities and outcomes are realized. Control Reviews focus on two levels: the overall DOT or OA IT Investment Portfolio and individual DOT or OA IT projects.

Control Phase Steps	Responsibility
1. Semi-Annual Review of the IT Portfolio	IRB
2. Semi-Annual Review of IT Projects	IRB/PM
3. Quarterly Recommendations	IRB/CIO (DOT & OA)

Step 1: Semi-Annual Review of the IT Investment Portfolio
At least semi-annually, the Departmental IRB or each OA IRB will conduct a general review of the financial health of that organization's IT Investment Portfolio, which includes all ongoing IT projects. This high-level review focuses on whether or not the proportion of actual versus

planned expenditures in a portfolio area is acceptable. One example of how the Departmental IRB or each OA IRB can track the health of its portfolio is to identify desired proportions for spending between portfolio areas as a "target state", and then compare the "actual state", as shown in Figure 5. Areas of the portfolio can be rebalanced as necessary through budget actions to increase/decrease project funding in that area; adjust projects in other portfolio area(s); or, re-adjust the proportions between portfolio areas in recognition of a change in conditions.

Figure 5. Example Target vs. Actual IT Portfolio Spending

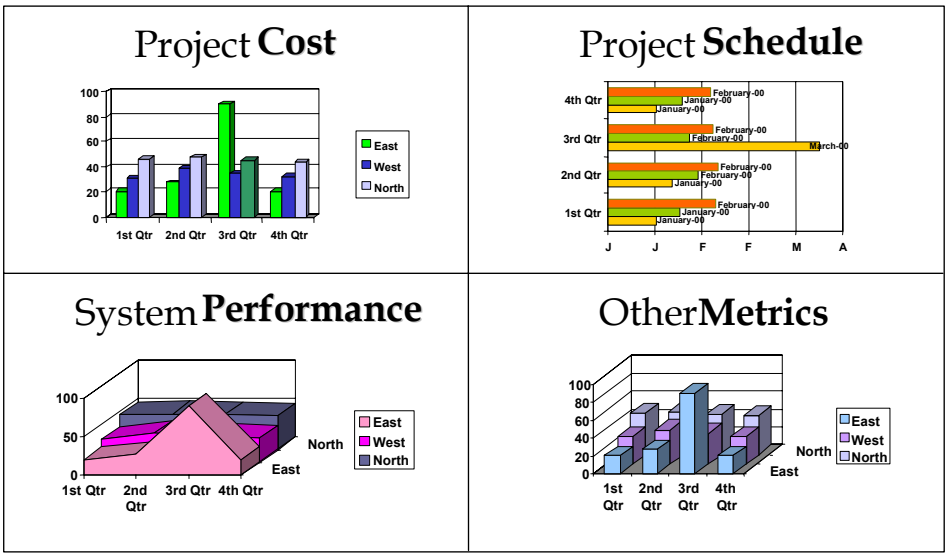


Step 2: Semi-Annual IT Project Reviews

The second area of focus for CPIC Control Reviews is the individual DOT or OA IT projects that comprise the DOT or OA IT Investment Portfolio area. An IT project is scheduled for inclusion in one of the semi-annual Departmental IRB or OA IRB Control Reviews at least once each fiscal year, or whenever a major milestone is reached (e.g., completion of a significant phase of the IT project, implementation of a functional module in an IT system, completion of testing, a ten percent or greater change in cost or schedule, significant performance changes, or changes in key personnel).

The foundation of CPIC Control Reviews at the project level is the presence of a baseline of metrics for cost, schedule, performance, and other measures. These were identified in the CPIC Planning Phase as part of the original Business Case, and were considered and approved as part of the Selection Phase. One suggested way to present cost, schedule, performance, and other metrics during Control Reviews is for the Departmental IRB or OA IRB to request a standardized presentation of key measures from each associated PM, along the lines of the generic example provided below in Figure 6. By standardizing this presentation, the Departmental IRB or each OA IRB and associated PMs can function more efficiently in reviewing numerous projects over the course of a year. Departmental or OA IRB Control Reviews may last several hours or one to two days depending upon the number, type, and complexity of IT projects that are up for review.

Figure 6. Example of a Project Metrics Presentation



Another aspect of project-level Control Reviews is the continual monitoring of alignment with DOT and/or OA strategic goals, architectural standards, security, privacy requirements, and other applicable Federal mandates such as 1998 Rehabilitation Act Section 508 disabled access.

Step 3: Make Recommendations

The DOT CIO is to make recommendations to the Secretary as to whether or not IT projects should be continued, modified, or cancelled.* The DOT IT CPIC process supports this requirement through quarterly DOT CIO reports presented to the Secretary/Deputy Secretary. The result of the semi-annual Control Reviews of the overall IT Investment Portfolio and of individual projects provides this information, as does the regularly updated information obtained from the ITIPS database. It is intended that the DOT and OA CIOs, as well as Departmental IRB and OA IRB members, will collaborate on the recommendations made in this quarterly report to the Secretary/Deputy Secretary to promote consensus building, communication, and cooperation. If agreement on a recommendation cannot be reached among the DOT CIO, the OA CIOs, and Departmental IRB and OA IRB members, the recommendation of each should be provided separately and explained to the Secretary/Deputy Secretary. Appendix 8 provides an example of a CIO's quarterly report to the Secretary/Deputy Secretary.

**All recommendations and requirements contained in this manual are applicable to the FAA, to the extent that such requirements and recommendations are consistent with the express language contained in 49 U.S.C. 106, 4011, 40121 .*

1.016 Evaluation Phase

Initiated upon completion of a project, the CPIC Evaluation Phase includes an initial Post-Implementation Review (PIR) and a subsequent Operations and Maintenance (O&M) PIR for operational IT systems. As trends over the past two decades have shown that most of the total life-cycle cost of an IT system relates to operations and maintenance (O&M), it is important

from a capital planning perspective to continually monitor and assess the status of implemented projects. The goal of the Evaluation Phase is two-fold: (1) to improve the way that IT projects are developed and implemented; and (2) to improve or retire existing IT systems, applications, and databases in a timely manner if they are no longer cost efficient or adding sufficient value to DOT mission accomplishment. This final CPIC phase also applies its "lessons learned" to the other three phases. The intent is to realize improvements in cycle time, project and system quality, and cost/schedule control.

Evaluation Phase Steps	Responsibility
1. Post-Implementation Review at Project Completion	IRB/PM
2. Annual System Operations & Maintenance Review	IRB/PM
3. Annual CPIC Process Review/Apply Lessons Learned	IRB/PM

Step 1: Conduct Project Post-Implementation Reviews
The initial PIR is conducted (normally by the cognizant PM) as soon as a DOT or OA IT project's system/application/database goes operational, and uses an accumulation of the project data developed to date. It is designed to detail how DOT or an OA has achieved (or missed) the desired outcome(s) of the project. The initial PIR captures information that falls into one of four categories: (1) Strategic and Financial, (2) Internal Business Processes, (3) Customer Satisfaction, and (4) Learning and Growth.

Strategic and Financial
At project initiation, the strategic goals and objectives of DOT or the OA are linked to the project's current performance measures as provided in the Business Case. As part of this PIR category, the Departmental or OA IRB completes a final analysis of all performance measures, defining the project's actual impact on the DOT or OA mission, strategic goals and objectives. The performance measures are then reviewed for continued relevance during the remaining life cycle of the project.

Financial impact is divided into two parts. First, final cost, schedule, performance, and other metrics are compared to the project's initial baseline. Second, the DOT or OA PM provides an updated estimate of O&M costs needed to support the system throughout the remainder of its life cycle.

Internal Business Processes
In this PIR category, the internal business processes affected by the now-operational system, application, and/or database are reviewed, especially those which may improve quality, cost, workforce requirements, infrastructure support requirements, and cycle time.

Customer Satisfaction
The core of any information system project is often to satisfy end-user requirements. This perspective is generally derived via end-user surveys conducted during IT system development and acceptance testing, and is periodically repeated during the project life cycle.

Learning and Growth
In this PIR category, the goal of learning and growth evaluation is to identify areas in both the capital planning process and project management practices that need improvement. This is a key element for identifying lessons learned and then implementing process improvements. Specific information from the project's development and implementation aid in this effort, including earned-value assessments (See Appendix 6.), the final deliverables quality report, the risk management trend report, and major PM and IRB decisions during the project's life cycle.

Step 2: Operations and Maintenance (O&M) PIR
The data required for the IT System O&M PIR revolves around four areas: (1) architecture alignment, (2) strategic alignment, (3) success of the security strategy and (4) O&M costs. Each DOT or OA PM will undertake a general assessment of the information in these areas once each year during this PIR to ensure a system/application/database is still in compliance with architectural framework and strategic objectives. Each DOT or OA PM also will submit updated O&M cost projections. This reflects differences in projected costs that have surfaced from information developed late in the project's implementation phase, or has arisen since the last PIR.

If the annual O&M PIR identifies needed major upgrades to, or replacements of, systems then a Planning Phase Business Case is assembled and channeled through the normal CPIC process. Substantial changes to existing projects, either in terms of impact or funding, necessitates that such projects be subjected to the same Departmental or OA IRB review and scrutiny afforded to new initiatives.

Step 3: CPIC Process Improvement
The purpose of CPIC Process Improvement is to identify trends that call for an adjustment to any level of the IT CPIC process, including ways to develop, select, and review Business Cases. Project officials should be the focus of such "lessons learned" activity based on their close association with individual projects and the overall CPIC process. IRB CPIC Process Improvement activity should address the following issues:

1. CPIC ability to support DOT and OA strategic goals and objectives
2. CPIC process cycle time and the impact/cost to PMs
3. CPIC ability to support and empower key stakeholders and users of IT systems.

1.017 Appendices

The appendices consist of templates, samples, guidance and clarifying information in support of the Information Technology Capital Planning Manual requirements.

1.017.1 Appendix 1 – Developing The Business Case

Business Case information must provide adequate detail for the reader to clearly understand the business need or advantage of implementing the project, and any anticipated impact(s) to current business processes and expenditures. This information is critical during the Select Phase of the CPIC process when the project is being reviewed, scored, and prioritized by the IRB. The project worksheet template provided can be used for projects of all dollar levels. However, the analysis conduct and resulting information provided will need to be reflective of the project magnitude and importance. This discretion in preparing the Business Case allows for a significant reduction in administrative burden where moderate or small dollar projects are under consideration.

Business Case development should take a top-down approach, beginning with a description of the project's scope as it applies to the business needs of the organization. The estimated cost of the project should then be derived and risks (including GISRA security considerations) identified before describing logistical considerations such as system requirements and compatibility. The templates addressing Cost Benefit Analysis and Risk Assessment follow in Appendices 4 and 5.

The Business Case template follows:

Business Case Template
(Exhibit 300 in ITIPS)

PART I:

A.SUMMARY OF PROJECT INFORMATION

Entry	**Description:**
Heading	Identify your agency, bureau, account title and identification code (using the OMB agency/bureau code and basic Treasury account symbol), the program activity from the most recent budget Appendix, the name of the project, and the unique project identifier if the acquisition is information technology. Indicate whether it is a new project proposed in your budget request for BY or later, or whether it is an ongoing project funded in CY or earlier.

Indicate whether the project, or useful segment, is incrementally or fully funded. (If the project is incrementally funded, your OMB representative may request your recommendation for distributing expected future incremental budget authority on a fully-funded basis.)

Indicate whether it was approved by your Executive Review Committee or Investment Review Board (IRB); whether the CFO reviewed the cost goals; and whether the Procurement Executive reviewed the acquisition strategy.

Indicate whether it is an information technology (IT) project, as defined in section 53.2 of OMB Circular A-11. If it is, the following information must be provided:

Indicate whether it is a financial management system, as defined in section 53.2; whether it addresses a Federal Financial Management Improvement Act (FFMIA) compliance area; and, if so, which one.

Indicate whether it is covered by the Government Paperwork Elimination Act (GPEA), i.e., supports electronic transactions or record keeping, and whether it is included in the agency's GPEA implementation plan or whether it already provides an electronic option.

Indicate whether a Privacy Impact Assessment was performed. A Privacy Impact Assessment (PIA) is a process the business owner and IT developer use to address privacy issues in a program or Internet website under development. The purpose is to document that privacy protections have been integrated into the development of these automated systems at each stage of its life cycle. The PIA process provides a means to assure compliance with applicable laws and regulations governing taxpayer and employee privacy. For additional guidance, see the Internal Revenue Service website (a designated Federal CIO Council's "Best Practices" website) at: http://www.irs.gov/irs/display/0,,i1=46&genericId=15043,00.html

	Indicate whether the security of this project meets the requirements of the Government Information Security Reform Act (GISRA). Indicate whether any weaknesses were identified for this project in the annual GISRA program review or independent evaluation.

B.SUMMARY OF SPENDING

Entry	**Description:**
Summary of spending by phases	Provide amounts of budget authority and outlays (in millions of dollars) for the table. Note: project phases "Planning" plus "Full acquisition" are the same as the "Development/ modernization/ enhancement " entry described in exhibit 53, and "Maintenance" is the same as "Steady state" in exhibit 53. Also include a breakdown of estimated costs for IT Security including: Hardware/Equipment (e.g., intrusion detection systems, firewalls, infrastructure); Software (e.g., IT security software, as required); Labor (e.g., IT security documentation development; certification/accreditation).

C.PROJECT DESCRIPTION

Entry	**Description:**
	Briefly describe (less than ½page) the general purpose of the project and the expected performance outcome at project completion.

PART II.

JUSTIFICATION AND OTHER INFORMATION

Entry	**Description:**
A. Justification	Provide a full justification for the IT acquisition. This should include a clear statement of how the project will help you meet your agency 's mission, accomplish its long term strategic goals and objectives, and adhere to the annual performance plan required by GPRA. The justification should also include other information requested by the OMB representative or important to you,

	based on the "Principles of Budgeting for Capital Asset Acquisitions " in Appendix 300A of OMB Circular A-11.
B. Program Management	Identify whether there is a program manager and contracting officer devoted to the project and provide their names.
C. Acquisition Strategy	Specify whether the acquisition will be accomplished via a single contract or several contracts. If several contracts will be used, explain the role of each toward achieving the overall acquisition cost, schedule, and performance goals. What type of contract will you use (e.g., firm fixed-price, fixed-price incentive fee, cost-plus fixed fee) to mitigate or manage program risk? What financial incentives will you use to motivate contractor performance? Specify whether the contract statement of work is performance-based. How will you effectively use competition? If you conducted market research, what were the results? Will you use commercial off-the-shelf (COTS) products, or is custom-developed work necessary?
D. Alt. Analysis and Risk Mgmt.	Summarize the analysis of full life-cycle costs/total costs of ownership (including operations and maintenance); results of cost/benefit analyses, including return on investment; analysis of alternative options and underlying assumptions; and any tangible returns that benefit your agency but are difficult to quantify. Summarize your risk assessment and describe your plans to mitigate or manage project risks. Describe any factors that could affect project success and cost such as: schedule; logistical complications; interruption of funds; interruption of resources; technical approach; regulatory requirements; external interfaces; organizational support/endorsement; security considerations. Address replaced system savings and savings recovery schedule. Describe any dependent relationship(s) with, and impacts on, existing or proposed systems/processes (i.e., system impacts, interface impacts, process impacts, security impacts).
E. Enterprise Architecture	Identify whether this project is identified in your agency 's enterprise architecture, and if not, why. Explain how this project conforms to your agency 's enterprise architecture; technology infrastructure; and the

	Federal Enterprise Architecture Framework (FEAF). If you do not follow the FEAF, discuss which framework you use.
F. Security and privacy	Discuss the security plan for the project and: 1) demonstrate that the costs of security controls are understood and are explicitly incorporated in the life-cycle planning of the overall system, including the additional costs of employing standards and guidance more stringent than those issued by NIST; 2) demonstrate how the agency ensures that risks are understood and continually assessed; 3) demonstrate how the agency ensures that the security controls are commensurate with the risk and magnitude of harm; 4) identify additional security controls for systems that promote or permit public access, other externally accessible systems, and those that are interconnected with systems over which program officials have little or no control; 5) demonstrate how the agency ensures the effective use of security controls and authentication tools to protect privacy for those systems that promote or permit public access; and 6) demonstrate how the agency ensures that the handling of personal information is consistent with relevant government-wide and agency policies.
G. Gov't. Paperwork Elimination	If the project will support electronic transactions or record keeping that is covered by the Government Paperwork Elimination Act (GPEA), briefly describe those functions, and how this project relates to your agency 's GPEA plan. Also identify any OMB Paperwork Reduction Act (PRA) control numbers from information collections that are tied to this project.

PART III:

COST, SCHEDULE, AND PERFORMANCE GOALS

Entry	**Description:**
A. Description of PBMS	Identify the performance-based management system (PBMS) you will use to the achievement of, or deviation from, baseline goals during the life-cycle of the acquisition and the operation, use, and maintenance of the asset. Describe planned project management approach.

B. Original Baseline:	This is the baseline as first approved by your OMB representative and/or Investment Review Board (IRB). Even if a revised project baseline is approved at a later date, always display the original baseline in this section.
1. Orig. Cost and Schedule Goals:	Show the original baseline cost and schedule goals. The cost and schedule goals should include total costs for the project, important components of the project, and important interim cost projections. It should also show how many months it will take to complete the project and important milestones within that schedule.
2. Original performance goals:	List or describe the original baseline measurable performance benefits or goals.
C. Current Baseline:	If your OMB representative or IRB approves any changes or revisions to the original project baseline goals, show the cost, schedule, and performance goals that are now in effect.
1. Cost and schedule goals:	The cost and schedule goals should include total costs for the project, important components of the project, and important interim cost projections. It should also show how many months it will take to complete the project and important milestones within that schedule.
2. Performance goals:	List or describe the current measurable performance benefits or goals, and indicate whether they are described in the contract statement of work.
D. Act. Perf. and Variance from OMB-approved baseline (original or current):	Monitoring actual work performed against baseline goals is year-round activity. Using the info. provided by your selected performance-based management system, you should compare the actual work accomplished and costs incurred to the planned work and budget and report on the variance. If you are establishing goals for the first time this year, leave this section blank.
1. Actual Cost and Schedule Performance:	Report on the planned and budgeted work that was accomplished and the actual cost of the work completed.
2. Cost and Schedule Variance:	Report on whether the actual work completed is behind the baseline schedule by 10 percent or more or actual costs incurred exceed your planned budget by 10 percent or more. If so, explain the reasons for the variance.

3. Performance variance:	Based on actual work accomplished and costs incurred, report on whether you still expect to achieve your baseline performance goals. If not, and you now expect to achieve less than 90 percent of your performance goals, explain the reasons for the variance.
E. Corrective Actions:	If the current cost, schedule or performance estimates vary from the baseline by 10 percent or more, explain what corrective actions have been or will be taken. Describe the effect the actions will have on cost, schedule, and performance. Explain how the project will be brought back within baseline goals or, if not, how and why the goals should be revised, and whether the project is still cost beneficial and should continue. If you are establishing goals for the first time this year or are reporting no baseline variances, leave this section blank.

1.017.2 Appendix 2 – Security During IT CPIC Phases

Process Requirements:

The CPIC process itself will include four phases (Planning, Selection, Control, and Evaluation), overseen by senior level Investment Review Boards (IRB), at the Departmental and/or OA level, charged with making key decisions at critical process points during each project's carefully managed system life cycle.

No investment in IT should be made without a thorough consideration of the security requirements. During the "Planning" phase, security requirements/safeguards for the proposed system should be defined and then validated by an initial risk assessment. Next, it is necessary to initiate a Security Plan that conforms to National Institute of Standards and Technology (NIST) SP 800-18. Lastly, the costs, resources, and schedule to implement security safeguards outlined in the Security Plan should be developed and incorporated into the Business Case.

In the "Selection" phase, the Business Cases are reviewed and prioritized collectively with other candidate project initiatives for inclusion in budget requests. If the project's budget request is selected for approval, the project enters the "Control Phase" of the CPIC process.

During the "Control" phase, the system is developed and the security requirements/safeguards as outlined in the Security Plan and Business Case are implemented. Next a formal security test and evaluation will be conducted as part of the Security Certification process. The last security

step of the "Control" phase, Security Accreditation of the system, will normally be accomplished just before implementation of the production system.

Finally, the "Evaluation" phase of capital planning centers around Post-Implementation Reviews, which should include a review of the IT System Accreditation report and a discussion of the degree of risk mitigation that was achieved. (OST Information Technology Security Program document dated May 1, 2001)

Planning Phase

The IT security requirements baseline should be defined and documented for each project early in its Planning Phase, by performing the following four steps: (NIST SP 800-26, 3.1.6 and NIST SP 800-18)

1. Document the current system configuration including inventory of proposed hardware and software including links to other systems. (NIST SP 800-26, 1.1.1 and NIST SP 800-18));

2. Determine scope of system by developing written agreements regarding how data is shared between interconnected systems. (NIST SP 800-26 12,2,3; OMB A-130, III, NIST SP-800-18)

3. Determine sensitivity of the system. (NIST SP 800-26 3.1.1; OMB Circular A-130, III; FISCAM AC-1.1 & 1.2; NIST SP 800-18)

4. Perform an initial risk assessment to determine and validate security requirements. (NIST 800-26, 3.1.7; NIST SP 800-18)

Next, the Security Plan should be developed using the framework provided by the Security Requirements Baseline and its supporting documentation. The Security Plan should contain topics prescribed in NIST Special Publication 800-18. (NIST SP 800-26, 5.1.2 and NIST SP 800-18) Costs, resources, and schedules to implement security safeguards defined in the Security Plan should be developed and incorporated in the Business Case.

In conducting these planning activities, it is important to address OMB's expectation that budget requests for increased IT security funding be clearly identified and that the relative projected performance increase from the requested funding be addressed.

Selection Phase

In the Selection Phase, when Business Cases are reviewed and prioritized collectively with other candidate project initiatives for inclusion in budget requests, IT security factors should be a salient decision-making consideration. In this phase, IT security factors should be considered of similar importance to such other critical selection factors as mission need, project performance, schedule, risk and cost. The full integration of IT security into the analyses conducted during the Planning Phase will allow for appropriate emphasis to be placed on IT Security in making project funding and management decisions in the Selection Phase.

Control Phase

The actual acquisition and implementation of selected security safeguards occur during the Control Phase and will include implementation of the following:

1. Personnel Security (NIST SP 800-26, 6.; OMB Circular A-130, III)
2. Physical and Environmental Protection (NIST SP 800-26, 7)
3. Production, Input/Output Controls (NIST SP 800-26, 8)
4. Contingency Planning (NIST SP 800-26, 9)
5. Hardware and System Software Maintenance (NIST SP 800-26, 10; OMB Circular A-130, III)
6. Data Integrity (NIST SP 800-26, 11; OMB Circular A-130, 8B3)
7. Documentation (NIST SP 800-26, 12; OMB Circular A-130, 8B3)
8. Security Awareness, Training, and Education (NIST SP 800-26, 13.; OMB Circular A-130, III)
9. Incident Response Capability (NIST SP 800-26, 14.; OMB Circular A-130, III; FISCAM SP-3.4; NIST SP 800-18)
10. Identification and Authentication (NIST SP 800-26, 15; OMB Circular A-130, III, FISCAM AC-2, NIST SP 800-18)
11. Logical Access Controls (NIST SP 800-26, 16; FISCAM AC-3.2; NIST SP 800-18)
12. Audit Trails (NIST SP 800-26, 17; OMB Circular A-130, III; FISCAM AC-4.1; NIST SP 800-18)

Project decisions made during this phase should continue to place appropriate emphasis on IT security. Each project manager should report IT security status using defined IT security performance assessment criteria in tandem with other life cycle management rating activities covering performance elements such as technical, schedule, risk, cost and budget status. These ratings should include the results of an evaluation of each project's IT system disaster recovery plan and Certification and Accreditation status (See definitions below.). In no event should a new IT system be implemented prior to completion of Certification and Accreditation activities required by the DOT IT Security Program. To the extent possible, existing legacy systems should be upgraded to reflect the current security standards and practices.

Certification – The implementing and testing of information system security safeguards for a system or application.

Accreditation (Authority To Operate) – The process by which a system owner applies for a formal declaration by an agency official that a system or application meets the applicable Federal policies, regulations and standards.

Evaluation Phase

During the Evaluation Phase, A Post-Implementation Review (PIR) should be conducted on each completed project. The PIR provides an opportunity to draw conclusions as to the overall success of the IT security aspects of each project, the degree of security risk mitigation that has been achieved as a part of the overall project effort, the reasons for the levels of success achieved, and any lessons learned. Lessons learned relative to IT security matters should then be applied to subsequent projects, along with lessons learned from other project areas.

Security Funding And Reporting Guidelines:

Integration With ITIPS

As discussed above, IT security should be a primary and visible consideration in all phases of the IT CPIC process. Security and other comprehensive IT project information will be collected, managed, and maintained in the capital planning database (ITIPS), regularly updated by OST, TASC and the OAs. The database will serve as a project management tool for use by these organizations, and will permit the compilation of project data for reports and information required by Congress and OMB. Therefore, it is imperative that this information be complete, current, and accurate.

Integration With Government Information Security Reform Act Reporting And OMB Exh. 53

Information included in the database for each system must include specific percentages associated with IT security that are supportable by detailed cost estimates. These cost estimates and the percentage spent for security as recorded in OMB Exhibit 53 should have also been documented in the Security Plan as illustrated below:

Total Operations Cost: $000,000,000

	Security Costs
1. Personnel Security (NIST SP 800-26, 6.; OMB Circular A-130, III)	$000,000
2. Physical and Environmental Protection (NIST SP 800-26, 7.)	$000,000
3. Production, Input/Output Controls (NIST SP 800-26, 8.)	$000,000
4. Contingency Planning (NIST SP 800-26, 9.)	$000,000
5. Hardware and System Software Maintenance (NIST SP 800-26, 10; OMB Circular A-130, III)	$000,000

6. Data Integrity (NIST SP 800-26, 11; OMB Circular A-130, 8B3)	$000,000
7. Documentation (NIST SP 800-26, 12; OMB Circular A-130, 8B3)	$000,000
8. Security Awareness, Training, and Education (NIST SP 800-26, 13.; OMB Circular A-130, III)	$000,000
13. Incident Response Capability (NIST SP 800-26, 14.; OMB Circular A-130, III; FISCAP SP-3.4; NIST SP 800-18)	$000,000
14. Identification and Authentication (NIST SP 800-26, 15; OMB Circular A-130, III, FISCAM AC-2, NIST SP 800-18)	$000,000
15. Logical Access Controls (NIST SP 800-26, 16; FISCAM AC-3.2; NIST SP 800-18)	$000,000
16. Audit Trails (NIST SP 800-26, 17; OMB Circular A-130, III; FISCAM AC-4.1; NIST SP 800-18)	$000,000
Total Security Costs:	$

Total Security Costs/Total Operations Cost =0.0%

If security for a specific system or project is funded out of a central fund, a prorated amount of that fund should be allocated to security for each system in the database. OMB has indicated that it will assume if no dollars are assigned to a particular project on the Exhibit 53, then no security protection is planned for that system. This assumption could trigger unnecessary questions during the budget process. It is also important for security percentages on the Exhibit 53 to be consistent with dollars included in the annual GISRA Report. As originators of project information, the fundamental responsibility for information reliability resides with those having project ownership. CIOs and ISSOs should ensure that IT security percentages in the Exhibit 53 are reconciled with the dollars in the the GISRA Report prior to its submission to OMB.

1.017.3 Appendix 3 - Glossary

Alternatives Analysis	Assessment of all technological options to determine the optimal solution for meeting functional requirements based on cost, scope and schedule; considers in-house or outsourcing options.
Annual Performance Reports	Annual performance reports compare actual performance to the annual goals established in agency performance plans. Both the Government Performance and Results Act and the Clinger-Cohen Act require agencies to submit these reports with their budget submission to Congress.
Architectural Alignment	Degree to which the IT project is compliant with the Department's enterprise architectures (including security considerations).

Business Case	Structured proposal for business improvement that functions as a decision package for IRB members. A business case includes an analysis of business process performance and associated needs or problems, proposed alternative solutions, assumptions, constraints, and a risk adjusted cost benefit analysis.
Capital Planning	The overall process used to plan, budget for, acquire (whether through purchase or lease) and manage capital assets, regardless of type of funding involved.
Capital Planning Work Group (CPWG)	Staff members typically provided by the Office of the Chief Information Officer for purposes of facilitating the DOT IT capital planning and investment control process by ensuring that appropriate business case information is prepared by project sponsoring organizations and that it is coordinated among the participants in the investment review process.
Chief Information Officer (CIO)	An official in an organization charged with the responsibility for providing expert advice, guidance and assistance to the organization's managers at all levels to ensure that IT technology and resources are acquired and managed in an efficient and cost effective manner. Duties typically include tracking and review of planned, ongoing and fully implemented IT projects relative to established performance measures, and making recommendations covering selection, management, continuation and/or termination of such projects to the organization's management. This official also has the responsibility to develop, maintain and facilitate a sound and integrated IT EA, as well as promote the effective and efficient design and operation of all major information resources management processes for the organization, including improvements to work processes of the organization.
Control	Ongoing monitoring process that manages investments against schedules, budgets, and performance measures
Cost/Benefit Analysis	Compares the costs associated with the IT project to the savings derived from the expected business outcome and operational improvements resulting from the IT project.
Crosscutting Capital Investments	Investments in capital assets that affect multiple DOT Operating administrations.
Documentation Set	Documents that may be required to fully justify and implement an IT investment.

Enterprise Architecture	A strategic model of information assets represented by integrated components comprising business, data, application and technology architecture layers that are aligned with DOT's mission, business goals and objectives. The architecture defines the business requirements, the information systems and technologies necessary to execute business activities and the transitional processes needed to implement new technologies in response to and in support of changing business needs.
Evaluate	Review process that takes place after an investment is operational to determine whether the investment meet expectations.
Information Technology (IT)	Any equipment or interconnected system or subsystem of equipment that is used in the automatic acquisition, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by an executive agency. Also, this applies under a contract with an executive agency, which requires either: (i) the use of such equipment or (ii) the use of such equipment, to a significant extent, to perform a service or furnish a product. This term includes computers, ancillary equipment, software, firmware and similar procedures, services (including support servicesas local area network (LAN) support and help desk support; and related resources). Also, it refers to the hardware and software operated by a Federal agency or by a contractor of a Federal agency or other organization that processes information on behalf of the Federal government to accomplish a Federal function, regardless of the technology involved, whether computers, telecommunications, or others.
IT Investment	The decision by a DOT organization to expend resources of the actual expenditure of resources on selected information technology or IT-related projects with the expectation that the benefits from the expenditure meets or exceeds the value of the resources expended.
IT Investment Portfolio	The collection of IT projects approved by the OA/OST IRB to address DOT's strategic and programmatic objectives, and to support managerial business operations and administrative functions.
Life-Cycle Costs	Total cost of an IT project over its expected life.

Mission Critical System	Any telecommunications or information system used or operated by an agency or by a contractor of an agency, or other organization on behalf of an agency, that: • Is defined as a national security system under Section 5142 of the Clinger-Cohen Act of 1996 (40 U.S.C. 1452); or • Is protected at all times by procedures established for information which has been specifically authorized under criteria established by an Executive Order or an Act of Congress to be classified in the interest of national defense or foreign policy; or • Processes any information, the loss, misuse, disclosure or unauthorized access to or modification of, would have a debilitating impact on the mission of an agency.
Operating Administration (OA)	Refers to the 14 DOT entities: Office of the Secretary (OST), Bureau of Transportation Statistics (BTS), Transportation Administrative Service Center (TASC) and the eleven (11) operating administrations [Federal Aviation Administration (FAA), Federal Highway Administration (FHWA), Federal Motor Carrier Safety Administration (FMCSA), Federal Railroad Administration (FRA), Federal Transit Administration (FTA), Maritime Administration (MARAD), National Highway Traffic Safety Administration (NHTSA), Research and Special Programs Administration (RSPA), Saint Lawrence Seaway Development Corporation (SLSDC), Transportation Security Administration (TSA) and the United States Coast Guard (USCG)].
Performance Measures	Method used to determine the success of an project by assessing the investment contribution to predetermined strategic goals. Measures are quantitative (staff-hours saved, dollars saved, reduction in errors, prevention of security breaches) or qualitative (quality of life, customer satisfaction).
Performance Plans	The Government Performance and Results Act (GPRA) requires that 1) each agency establish an annual performance plan that covers each project activity identified in its budget and establishes performance goals to define the performance level of activities, 2) expresses such goals in an objective, quantifiable, and measurable form, 3) establishes performance measures or indicators to be used in measuring or assessing the relevant service levels, outcomes or outputs and comparing actual project results with the established performance goals, 4) describes the operational processes, skills and technology, and the human, capital, information, or other resources required to meet the performance goals, 5) provides a basis for comparing actual project results with the established performance goal, and 6) describes the means to be used to verify and validate measured values.

Post-Implementation Review (PIR)	Evaluation of the IT project after it has been fully implemented to determine whether the targeted outcome (e.g., performance measures) of the project has been achieved. The PIR should also include an evaluation of the effectiveness of the Planning -Select - Control - Evaluate process as it relates to the IT project.
Project Manager (PM)	Individual with authority and responsibility for day-to-day management and decision-making for a project during its entire life cycle (planning, selection, control, and evaluation).
Project Sponsor (PS)	Individual who acts as the managerial advocate of a project for the purpose of ensuring that Departmental senior leadership provides endorsement and resources for the project.
Project Plan	Outlines performance-based management approach (current and estimated goals) including project milestones and associated resources, tools and techniques, and organizational roles and responsibilities.
Risk	An uncertain event that negatively affects the performance objectives (cost, schedule, scope or quality) of a project.
Risk Assessment and Mitigation Plan	A description of potential cost, schedule, and performance risks, and impact of the proposed system to the infrastructure; includes a sensitivity analysis to articulate the effect different outcomes might have on diminishing or exacerbating risk. Provides an approach to managing all potential risks, including security.
Return-on-Investment (ROI)	ROI = tangible benefit + replaced systems savings - investment cost.
Security Accreditation (Authority To Operate)	The process by which a system owner applies for a formal declaration by an agency official that a system or application meets the applicable Federal policies, regulations and standards.
Security Certification	The implementing and testing of information system security safeguards for a system or application.
Security Plan	Descriptions of system security considerations, such as system access, physical or architectural modifications, and adherence to Federal and Departmental security standards.
Select	Process used to identify all new, ongoing, and operational investments for inclusion into the funded IT portfolio.
Selection Criteria	Factors identified by DOT to prioritize and discriminate IT investments selected for subsequent funding.

Systems Development Life Cycle	A sequence of phases and or stages that comprise the process for developing software applications and systems. The sequence spans from the identification of need through deployment, operation, and retirement.
Systems Development Methodology	The set of methods, techniques, and procedures of an SDLC process. The methodology provides a general framework for systems design, development, and deployment as well as outlines roles and responsibilities, development activities, conducting quality reviews, and gathering milestone concurrence.

1.017.4 Appendix 4 – Cost/Benefit Analysis

The Business Case in Appendix 1 has a "Cost and Schedule Goals" section where the PM/Sponsor must indicate the estimated project costs and the value of the benefits to be obtained through the project. One comprehensive method of assessing these figures is the Cost/Benefit Analysis, which allows the user to record both tangible and intangible benefits, score results and make appropriate recommendations about project costs versus benefits. The Federal CIO Council recommends that a CBA contain the following four elements:

- Total business and system cost with the IT investment/new system
- Total business costs without the IT investment/new system
- Tangible benefits
- Intangible benefits

In order to accomplish the most accurate CBA, it is important that all financial movement (inflows and outflows) throughout the life of the project are accurately portrayed in the project's timeline. All costs and benefits, both tangible and intangible, should be included or acknowledged in the analysis. The term "costs" refers to both the incurred expenses of an investment and its capitalized costs, and can be categorized as direct or indirect. Direct costs include materials, labor, and other expenses having a direct bearing on the product or service. Disposal costs, often overlooked in planning, fall within this category. When calculating labor costs, OMB recommends using prevailing wage rates and salaries. To arrive at fully burdened personnel costs, you must add overhead costs to salary and fringe benefit costs. OMB Circular A-76, Performance of Commercial Activities, and Part II of the A-76 Revised Supplemental Handbook provide further guidance on fringe benefit factors and percentage rates for overhead calculations.

For CBA purposes, costs (direct and indirect) should only be included if they will change with the introduction of a proposed initiative. As an example, when comparing a proposed system replacement to the continued use of a legacy system, only the ongoing costs of the legacy system are included in the analysis. The original acquisition costs of the existing system and costs of any enhancements should not be included in the comparison.

An accurate and complete picture of the existing system's costs and benefits must be developed to assess what the organization already has and how much it costs. System limitations of present assets (such as capacity limitations) are important to investigate for identification of needed upgrades or enhancements.

Organizing cost findings as they relate to the budget and reporting requirements contained in OMB Circular A-11 Exhibits 52 and 53/Schedule 300 will facilitate final compilation of this data when it is required for submittal. It is recommended that research for additional costs be an ongoing process to further refine the accuracy of the CBA and improve the long-term success of IT projects.

When gathering benefits, it is recommended to include all benefits regardless of how difficult it may appear initially to quantify or support them. Also, it is important to note that secondary benefits not directly tied to the initiative's main objective can occur in the course of an IT project. The CBA template can be utilized to compute the total cost, total benefit and the Net Present Value (NPV) of the alternative under examination. NPV is a standard criteria endorsed by OMB Circular A-94 for assessing the discounted tangible value of expected benefits. In addition to the calculation of NPV, portrayal of the inflows and outflows of project funds over time provides the information needed to estimate the payback period associated with the initiative. The payback period is the period of time necessary to recover investment costs, resulting in a break-even point when this recovery occurs.

Selection of investments based solely on CBA findings is not always prudent or practical. There are many other factors to consider in the selection process such as regulatory mandate, business and/or public needs. CBA is considered by OMB to be a principle selection tool for IT portfolio development. In any event, the projection of long-term financial impacts during CBA improves the ability to proactively manage the financial health of these projects throughout their life cycle.

In order to accomplish the most accurate Cost/Benefit Analysis (CBA), it is important that all financial movement (inflows and outflows) throughout the life of the project be accurately portrayed in the project's timeline. All costs (including separately identifiable security costs) and benefits, both tangible and intangible, should be included or acknowledged in the analysis. The quantification of intangible benefits can be a challenging effort, however, an attempt should be made to include these benefits as quantifiable components. Of course, the assumptions/rationale used to quantify these benefits should be clearly explained within the analysis to expedite the acceptance of this data during evaluation of the proposal.

Identifying Costs

Examples of indirect costs include rent, utilities, insurance, indirect labor, and other expenses usually charged to the organization as a whole. Within the Federal government, indirect costs are normally separated into operational overhead, and general and administrative overhead. Operational overhead is defined as cost not 100% attributable to a particular activity and is usually associated with ongoing management. General and administrative overhead includes

salaries and equipment and relates to the functions performed in support of, but outside of an activity.

Maintaining the *status quo* must also be evaluated as an option. For this reason, an accurate and complete picture of the existing system's costs and benefits must be developed to assess what the organization already has and how much it costs. System limitations of present assets (such as capacity limitations) are important to investigate for identification of needed upgrades or enhancements. The Department's asset tracking system can be useful when assembling the capability and cost information for current systems.

OMB's Capital Programming Guide, Section I-2, recommends the use of multi-disciplinary Integrated Project Teams (IPTs) to identify costs of proposed systems. It is recommended that these costs be estimated by business function to more accurately assess the impact of anticipated increases in demand. The IPT can inventory existing assets, as well as assets active through procurement such as leases, purchases, or service contracts. IPTs can then evaluate full life-cycle costs and the viability of meeting those costs within expected funding levels. The following list of suggested costs were provided by the Federal CIO Council's Capital Planning and Investment Committee:

Cost Checklist

Hardware/Equipment (purchase and lease costs)

- Client desktop workstations, laptops, and peripherals
- Servers: local workgroup and Enterprise servers
- Communications hardware (hubs, routers, bridges, switches)
- Power protection devices
- Memory upgrades
- Off-line storage devices
- Network cabling
- Network interface cards
- Lab or test equipment (% of use to specific project)
- Network upgrades
- Auxiliary furnishings (printer stands etc.)

Software

- Purchased COTS applications
- Periodic COTS license fees
- Desktop/workgroup software
- Network operating systems
- Application development tools
- Network and systems management applications
- Help desk tools for management
- Contractor supplied development and maintenance

Security

- Risk and Vulnerability Assessments
- Disaster Recovery/Continuity of Operations Planning and Physical Security Mechanisms
- Intrusion detection systems (IDS) and Firewalls
- Security training
- Anti-virus protection/detection/ eradication
- Desktop/workgroup IT security software

- Certification and accreditation
- IT Security Documentation Development
- Disaster recovery

Labor (fully burdened)
- Data encryption services/PKI/VPN
- Remote Access Security Services/TACACS+/RADIUS
- Wireless Security Services/WTLSS
- Installation costs
- Maintenance
- In-house development and modification
- Requirements development/documentation
- Testing
- System and network administration/management
- Help desk support
- Acquisition/contracting
- Procedures development
- IS staff training and education
- End-user training
- Supplemental staffing
- Shadow (hidden/secondary) costs
- Data maintenance
- Research and planning

Infrastructure
- Upgrades or additions to telecommunications lines
- Upgrades to power lines
- Upgrades to IT Security

Miscellaneous Costs
- Contractor costs
- Data storage costs
- Supplies (diskettes, toner, printer cartridges, paper, etc.)
- Consultant

Identifying Benefits

Benefits are defined as an advantage, profit, or gain realized. They should describe what the investment enables the organization to accomplish and how the mission is enhanced. It is recommended that the focus be on improved business outcomes rather than technology to properly articulate how the investment furthers the DOT/OA mission.

The identification of benefits should be facilitated through an assessment and comparison of the organizations current operations and capabilities to strategic/performance plans. It is recommended that functional capabilities (benefits) of proposed projects are discussed in relation to organization mission, objectives, current capabilities and operational constraints. This practice of tying measurable benefits to critical organizational objectives will not only aid in the comparison of alternatives, but will also build the foundation for development of project performance measures.

The Department promotes investments that provide enhanced services to the public, cost savings, and cost avoidance. When gathering benefits, it is recommended to include all benefits regardless of how difficult it may appear initially to quantify or support them. Also, it is important to note that secondary benefits not directly tied to the project's main objective can occur in the course of an IT project. The following list of suggested benefits were provided by the Federal CIO Council's Capital Planning and Investment Committee.

Benefits Checklist

Expanded Services or Products Delivered to Customers (Public/Internal/External)

- **Improves ability to deliver** – Providing receptionists and telephone service representatives with access to information via desktop PC's allows them to respond to customer inquiries more accurately and quickly.
- **Improves access to services** – The investment increases the number of people reached. Customers can communicate with an organization by telephone, e-mail, or Internet in addition to existing mail services. Customers are provided the ability to remit payment by credit card over the Internet or through direct draw on account.
- **Improves access to information** – Internal users gain direct access to resources or information enabling them to perform daily tasks more efficiently. The Public can obtain information on tax issues, health services, etc. via the Internet or telephone.
- **Improves accuracy** – The investment improves accuracy by reducing the need for manual data entry or reducing number of data entry errors, thus improving integrity of data. This may also improve productivity and reduce operating costs by reducing time spent on error correction.
- **Improves compatibility** – One alternative is more compatible with existing facilities and procedures, requiring less training of personnel or less new equipment and software. System meets Department/OA IT architecture requirements.

- **Improves effectiveness and impact of information delivered** – On-line interactive training tutorials provide employees unlimited opportunities to improve skills, increase participation in training, and improves retention of new information. This may increase productivity, reduce turnover, etc.
- **Provides options or flexibility for capturing future opportunities** – Investments that provide the ability to capture additional gains in the future. An investment in a network for the transfer of data between remote locations can support e-mail in the future. This approach can be particularly helpful in garnering support for investments in infrastructure and pilot projects.
- **Improves security** – System improves security in terms of fraud prevention, protection of confidential information, or enhances data integrity. Directly addresses GISRA requirements.
- **Reduces risk** – Back-up systems that reduce the risk of data loss or applications that improve timely delivery of critical information.

Cost Savings/Cost Avoidance

- **Improves the ability to maintain a system** – Investments for which maintenance resources (personnel, experience, components) are more readily available. Ease of maintenance is relevant to both software and hardware.
- **Eliminates duplicate assets** – Investments that replace multiple, non-compatible, stand-alone systems.
- **Improves reliability** – System has better performance record (less down-time) than legacy process or system. Reductions in downtime inversely impact productivity and may also reduce labor costs.
- **Accommodates increases in workload or demand without additional costs** – Systems that will 'avoid' hiring additional personnel to handle increased workload or new Department/OA responsibilities in the future.
- **Reduces manual operations** – Systems that automate manual processes thereby freeing staff resources to perform other functions, reducing or eliminating FTE requirements. Systems that allow functions to be performed by lower level staff.
- **Improves efficiency** – Assets that improve access to information or tools that decrease time required to perform daily functions. A system may provide faster or more accurate aggregation and analyses of data.

Enhanced Work Environment

- **Facilitates ease of use** – Although user-friendly systems are generally thought of in terms of increased efficiency or productivity, they can also improve the social and physical environment for employees.
- **Improves physical environment** – Systems that reduce the amount of paper, clutter in the work area, noise, or eye strain.

- **Improves response rates** – Assets that reduce stress by improving employees' ability to respond to customer inquiries.

Return-on-Investment

There are several interpretations of the definition and subsequent method to determine Return-on-Investment (ROI). Recent government IT investment practices indicate that consideration of the project's total value (tangible and intangible components) produces the most realistic and useful ROI value. For the purposes of this guide, ROI is a measure of the total tangible (quantitative) and intangible (qualitative) value, minus the investment costs realized from implementation of a project.

The previous section concerning CBA discusses the process of calculating the total costs and benefits of a project. Naturally, the more you can quantify the intangible project benefits, the more accurate your estimate of project value will be. In some cases, the intangible values of a project will defy conventional forms of measure. In these cases, the intangible value of the project to the organization and its customers will need to be qualitatively factored into the decision making process to ensure that the entire investment outlook is understood in relation to the business requirements being addressed.

Analysis of Cost/Benefit Data

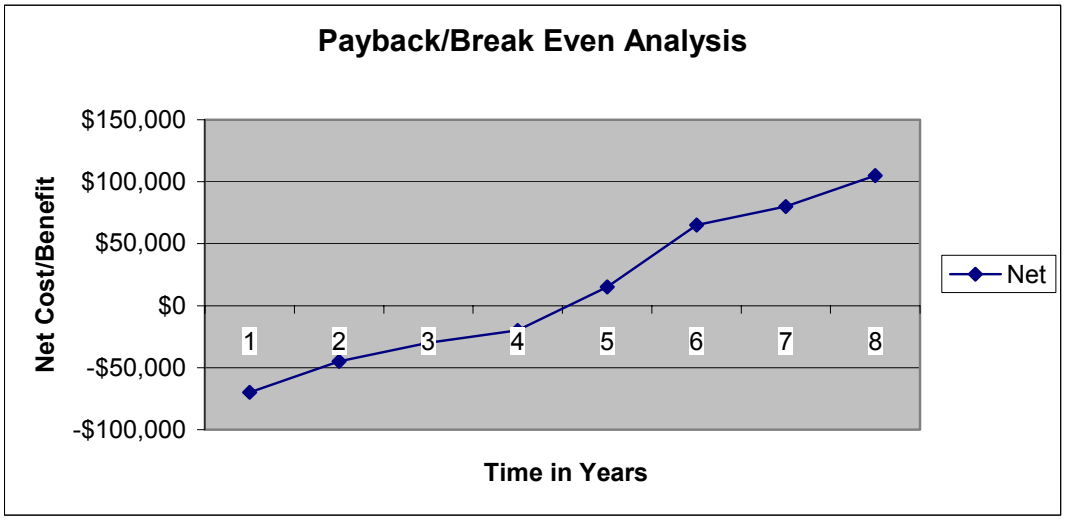
Once the cost and benefits of an IT project have been identified, the total cost, total benefit and the Net Present Value (NPV) can be calculated. Example VI.1 below shows the format to use for calculating these values over the life of a project using example data.

Example VI.1 **Cost/Benefit and Net Present Value Analysis**
Operating Administration/Office

Program Manager: Date Developed:
Project Manager: Date Presented:
Initiative Sponsor: Date Posted:

$ Benefits	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Type	$30,000	$40,000	$45,000	$45,000	$55,000	$85,000	$100,000	$120,000
Type								
Type								
Type								
Type								
Total	$30,000	$40,000	$45,000	$45,000	$55,000	$85,000	$100,000	$120,000
$ Costs	**Now**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
Type	$100,000	$85,000	$75,000	$65,000	$40,000	$20,000	$20,000	$15,000
Type								
Type								
Type								
Type								
Total	$100,000	$85,000	$75,000	$65,000	$40,000	$20,000	$20,000	$15,000
Net	-$70,000	-$45,000	-$30,000	-$20,000	$15,000	$65,000	$80,000	$105,000
Years	1	2	3	4	5	6	7	8
Total Benefit	$520,000							
Total Cost	$420,000							
Total Net	$100,000							
Net Present Value*	$20,466							

* NPV is using a 7% discount rate.



NPV is a standard criteria endorsed by OMB Circular A-94 for assessing the discounted tangible value of expected benefits. The value is calculated by discounting future cost and benefits using the appropriate discount rate (OMB's recommended Base Case rate is 7%) and subtracting the sum total of discounted costs from the sum total of discounted benefits. This calculation provides an estimate of the anticipated net benefit in future discounted dollars, since money will lose its value over time when compared to current dollars. The applicable formulas for NPV are provided below, however, for ease of computation most spreadsheet software packages are equipped with this formula.

$PV_{costs} = Total\ Cost/(1+i)^n$

PV_{costs} = Present Value of Cost
i = Discount Rate
n = number of periods (years) which discounting takes place

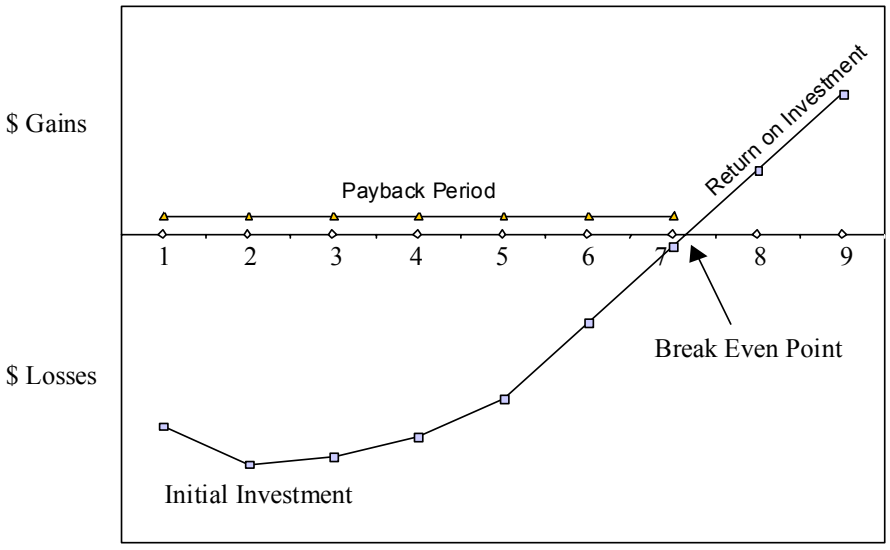
$PV_{benefits} = Total\ Benefit/(1+i)^n$

$PV_{benefits}$ = Present Value of Benefits
i = Discount Rate
n = number of periods (years) which discounting takes place

$NPV = PV_{benefits} - PV_{costs}$

- A positive NPV indicates that the total benefit is large enough to absorb the loss incurred by the discount rate and show a financial gain. This result is most desirable for a successful financial projection.
- An NPV of 0 indicates that the total benefit is large enough to absorb the loss incurred by the discount rate and break even with the total cost. Although not as desirable as a positive NPV, this result is typically acceptable if there are significant benefits associated with the project which justify implementation.
- A negative NPV indicates that the total benefit is not large enough to absorb the loss incurred by the discount rate, and depending on how large this negative value is, may indicate considerable net loss in current dollars and disapproval of the project.

In addition to the calculation of NPV, portrayal of the inflows and outflows of project funds over time as demonstrated in Template VI.1, provides the information needed to estimate the payback period associated with the project. The *payback period* is the period of time necessary to recover investment costs, resulting in a break-even point when this recovery occurs. The ROI should be adjusted using the NPV calculated for the project in order to produce a realistic ROI in terms of future dollars. Please see Example VI.2 below for a graphical depiction of these principles using example data.



Example VI.2 The graph depicts a project with a pay back period of seven years.

Once the above values have been calculated for all proposed alternatives, they can be readily compared using Example VI.3 below. It is important to note the assumptions used to quantify costs and benefits when making comparison's across investment options, particularly when dealing with intangible benefits.

Example VI.3 Comparison of Cost/Benefit Among IT Project Alternatives						
Alternative Name	**Total Life-Cycle Cost**	**Total Life-Cycle Benefit**	**NPV (discount rate %)**	**ROI**	**Payback Period** **Total Life-Cycle**	**Non-Quantifiable Intangible Benefits**
No Action						
Alternative #1						
Alternative #2						
Alternative #3						
Alternative #4						

1.017.5 Appendix 5- Risk Assessment and Mitigation Worksheet

With both Likelihood (Probability) and Impact scores on a scale from "1" to "5" (low to high), final risk scores could range from "1" to "25". A score of "5" or above would indicate the need to document a possible problem. A score of "10" or above could potentially flag the category as high risk. Weighted scores shown are sample scores only and reflect the product of the Likelihood and Impact scores.

Project Name: Investment Technology Information Portfolio System (I-TIPS)
Project Number:123458

STRATEGIC RISK

Alignment with DOT's strategic business goals and processes, and acceptance across the user community, reduces the risks of project cancellation or functional obsolescence. Score a greater likelihood of occurrence if it is more likely that the project will not (a) maintain alignment with DOT's strategic business goals and processes, or (b) gain acceptance by the user community. Please note Section 508 Compliance.
Description of Risk
Risk Mitigation Plan
Risk Scoring

	Likelihood	Impact	Weighted Score
	1	1	1

PROJECT MANAGEMENT RISK

Project plans, adherence to goals, and effective reporting mechanisms enhance the likelihood of a successful project completion. Score a higher likelihood of occurrence if project plans are incomplete or there are insufficient controls in place to identify and report on variances from cost and schedule.
Description of Risk
Risk Mitigation Plan
Risk Scoring

	Likelihood	Impact	Weighted Score
	1	2	2

TECHNOLOGICAL RISK

The greater degree to which the technology solution is aligned with DOT's enterprise information architecture, uses COTS/NDI, and represents a long-term solution, the lower the risk of technical integration or technical obsolescence problems. Score a higher likelihood of occurrence if the project is not aligned with the information or Web architecture, does not use COTS/NDI, or faces potential technical obsolescence.
Description of Risk
Risk Mitigation Plan
Risk Scoring

	Likelihood	Impact	Weighted Score
	1	1	1

DEVELOPMENT RISK

A history of development success, an incremental/modular approach to development, and a flexible acquisition approach that is aligned with the development approach all reduce the risk of failure, inability to capture some value in case of project cancellation, and potential for acquisition bottlenecks. Score a higher likelihood of occurrence if there is no history of development success for projects of similar size and scope, there is a greater risk from the absence of an incremental/modular approach development, or the acquisition approach does not provide DOT with the desired flexibility.
Description of Risk
Risk Mitigation Plan
Risk Scoring

	Likelihood	Impact	Weighted Score
	1	1	1

COST SENSITIVITY RISK

The independence costs from external variables, and the presence of an early detection system for cost variances, reduces the risk of cost overruns. Score a higher likelihood of occurrence if costs are more highly dependent on external variables or there is no system for detecting potential changes to cost in a manner that allows DOT to plan adequately for those changes.
Description of Risk
Risk Mitigation Plan
Risk Scoring

	Likelihood	Impact	Weighted Score
	1	5	5

PERFORMANCE RISK

The presence of a clear scope, set of functional requirements, and performance measures reduces the risk that the project will not have its intended business functionality or achieve the intended performance goals. Score a higher likelihood of occurrence if the scope, functional requirements, or performance measures are insufficiently clear to reduce performance risk.
Description of Risk
Risk Mitigation Plan
Risk Scoring

	Likelihood	Impact	Weighted Score
	1	1	1

OPERATIONAL RISK

Development and operation are less risky if the system meets departmental security requirements and there are fewer system interdependencies that could impact project success. Score a higher likelihood of occurrence if the system does not fully meet departmental security requirements or there is a high level of system interdependency.
Description of Risk
Risk Mitigation Plan
Risk Scoring

	Likelihood	Impact	Weighted Score
	1	5	5

1.017.6 Appendix 6– Earned-Value Management

Earned-Value Management Systems (EVMS) are used to continuously measure actual achievements against those identified as goals in the project plan. EVMS helps project teams stay on their intended course and helps to identify causes of cost and schedule slippage early in the project's schedule before these issues become (unmanageable or unrecoverable). This methodology also aids in the identification of a project's final costs and actual schedule. In order to facilitate the use of effective internal cost and schedule management practices, OMB Circular A-130 requires that all projects use an EVMS (or similar) approach in IT project management.

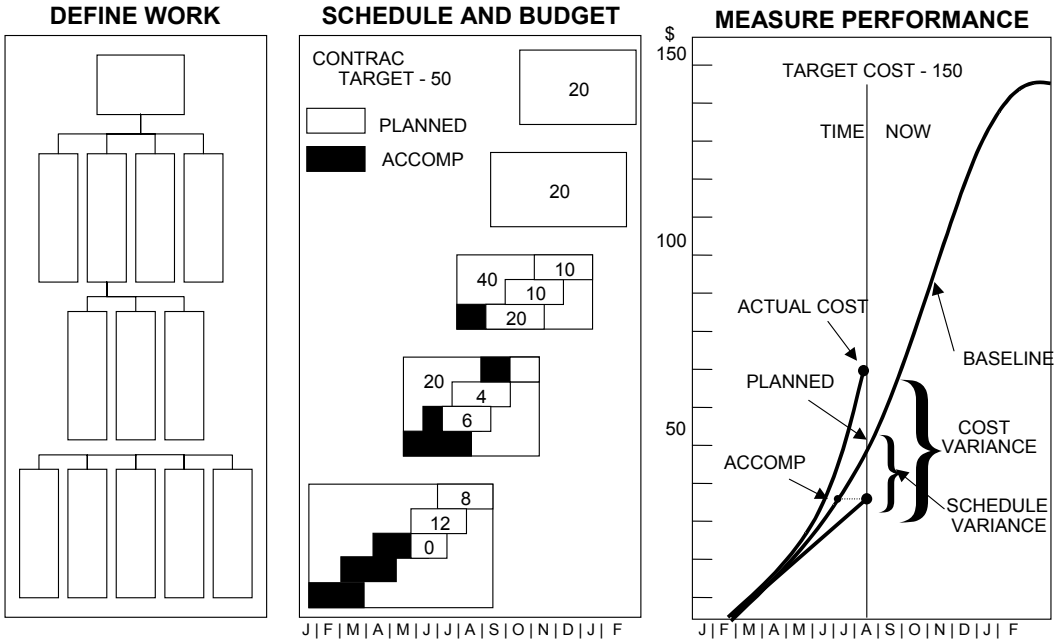
During the Planning Phase, the project manager should work with the team to develop a work breakdown structure based on the project's requirements and scope. Using the Work Breakdown Structure, the team develops a schedule of activities including tasks, milestones and deliverables. The team then associates the estimated costs for each of these. This process identifies the planned value of the project relative to the work scheduled.

Overview of Methodology for Conducting Earned-Value Analysis

As illustrated in the below figure, the following approach outlines the key steps necessary for establishing a process for assessing a project’s earned value:

1. Develop a Work Breakdown Structure (WBS)
2. Define project scope of work or project activities

3. Allocate costs to each WBS element
4. Schedule each activity
5. Chart and evaluate project status



The above steps provide the basis for evaluating project performance. This includes updating and reporting on the project's schedule of activities. The percent complete of unfinished activities is also reported. Once the project's schedule is updated, actual costs are recorded. After recording actual project costs for the reporting period, Earned-Value measures are calculated and reports generated.

Definition of Key Earned-Value Measures:

Budgeted Cost of Work Scheduled (BCWS) – The forecasted cost of performing scheduled activities.

Budgeted Cost of Work Performed (BCWP) – The amount of BCWS activities completed.

Actual Cost of Work Performed (ACWP) – The costs actually incurred in accomplishing the BCWP.

Cost Variance – The difference between the budgeted cost of work performed and the actual cost of work performed (BCWP-ACWP).

Cost Variance Percentage – The cost variance divided by the BCWP; multiply the result by 100.

Cost Performance Index (CPI) – A unit-less indication of project cost performance where: 1=matches budget, >1=under budget, and <1=over budget. This index is calculated by dividing the BCWP by the ACWP.

Schedule Variance – The difference between the budgeted cost of work scheduled and the budgeted cost of work performed (BCWS-BCWP).

Schedule Variance Percentage –The schedule variance divided by the BCWS; multiply the result by 100.

Schedule Performance Index (SPI) – A unit-less indication of project schedule performance where: 1=matches schedule, >1=ahead of schedule, and <1=behind schedule. This index is calculated by dividing the BCWP by the BCWS.

Estimate at Completion (EAC) – A calculation of the projects total estimated cost based on the dynamics of the above indicators. The formula for EAC is: **(BCWS - BCWP)/CPI + ACWS**

Example VIII.1 below demonstrates application of EVM using example data.

General Task Metrics				Planned/Actual Values			Cost Performance			Schedule Performance		
Activity Name	Business Days to Complete from Day 1	Percent Complete	Expense $/Month	Budgeted Cost for Work Scheduled (cumulative)	Budgeted Cost for Work Performed (cumulative)	Actual Cost for Work Performed (cumulative)	Cost Variance	Cost Variance %	Cost Performance Index	Schedule Variance	Schedule Variance %	Schedule Performance Index
	60	100%	$69	$300	$250	$275	-$25	-10%	0.91	-$50	-17%	0.83
	150	53%	$75,000	$200,000	$223,000	$300,000	-$77,000	-35%	0.74	$23,000	12%	1.12
	130	62%	$3,750	$15,000	$15,000	$15,000	$0	0%	1.00	$0	0%	1.00
	90	89%	$4,000	$20,000	$18,000	$16,000	$2,000	11%	1.13	-$2,000	-10%	0.90
	100	80%	$17,750	$64,700	$69,000	$71,000	-$2,000	-3%	0.97	$4,300	7%	1.07
	Totals			$300,000	$325,250	$402,275	-$77,025	-24%	0.81	$25,250	8%	1.08

Monthly Variance Explanation/Resolution:

Cumulative Months	4	Total Months	12
Project Estimate At Completion			$371,045
Total Project Budget			$300,000
Variance At Completion			-$71,045

1.017.7 Appendix 7 - Recommended Strategic Investment Criteria

Question	Guidance	Source Data
Strategic & Financial		
1. How well does the project's performance measures link to DOT's strategic goals and objectives? 0 = The project does not support nor is there is a linkage to DOT's strategic goals or objectives. 1 = The project supports a few of the strategic goals and objectives, or the linkages are weak or indirect. 2 = The project strongly supports the strategic goals and objectives.	• Cross-references the strategic goals and links the project with the budget	• DOT Strategic Plan • Business Case
2. Is the system a Congressional mandate and/or Secretarial priority? 0 = No 1 = Yes	• Many projects are being implemented as a result of legislation/directives such as: - OMB Circular A-127, Financial Management Systems, mandates that each Federal department and OA establish and maintain a single, integrated financial management system. - OMB Circular A-130, Management of Federal Information Resources, describes system security requirements. - OMB Circular A-123, Internal Control Systems, provides policies and procedures pertaining to establishing, maintaining, evaluating, improving and reporting on internal controls by Federal agencies.	• Business Case • Project Description

Question	Guidance	Source Data
3. Has a cost estimate for the project been defined that includes estimates for procurement, and operations and maintenance? Does the cost estimate include security considerations, and are security costs broken out separately (and attributable to specific activity)?	• IT security should be included in all phases and should include: - Hardware/Equipment: intrusion detection systems and Firewalls, as required - Software: IT security software, as required - Labor: IT security documentation development - Infrastructure: upgrades to IT security	• Cost/Benefit Analysis
4. Does the Cost/Benefit analysis include estimates for Return-on-Investment (ROI) that indicate that the investment will provide a justifiable return relative to the investment level required? 0 = The Cost/Benefit analysis does not include an ROI estimate or the benefit's value is less than 110 percent of the project's total cost 1 = An ROI was conducted that indicates a moderate return, where the benefit is greater than 110 percent but less than 140 percent of the project's total cost 2 = An ROI was conducted that indicates a high return, where the benefit is greater than 140 percent of the project's total cost	• The value of the benefit can include qualitative estimates for cost savings, cost avoidance and productivity increases. The value of benefits can also include estimates for the value of intangible benefits	• Cost/Benefit Analysis
5. Does the project have a work breakdown schedule and schedule that contains major phases, tasks and milestones that follow a logical sequence and that are comprehensive enough to ensure project completion and that have estimated costs associated with each of the major project tasks?	• Proper and thorough project planning dictates the identification of the major tasks and milestones at the outset of the project. • A project has a much higher likelihood for success if the project plan is logically-phased and does not contain any major gaps. • A project with costs associated to the major tasks helps to track the progress of the project and identify root causes of cost and schedule variance.	• Project work breakdown structure • Project schedule

Question	Guidance	Source Data
6. Will a dedicated project manager (and support staff) be assigned to the project who possess the full range of education, experience and managerial qualifications to oversee and guide the day-to-day progress of the project? Do all personnel to participate in the management of the project have the needed technical, management, business, budget and contracting knowledge and expertise?	• An appropriate mix of qualifications will facilitate the successful accomplishment of project performance goals and achievement of DOT/OA missions.	• Standards For Qualification and Training currently being developed by the Office of the Senior Procurement Executive (SPE)
Internal Business Processes		
1. Does the project fill a gap in target architecture requirements? 0 = The project does not fill a gap in target architecture requirements 1 = The project indirectly or partially fill a gap in target architecture requirements, or the gap it fills is week 2 = The project explicitly fills a gap in target architecture requirements	• Filling a gap in target architecture ensures that the business processes that the systems and technology support are met.	• Departmental/OA Architectural Framework
2. Is the project redundant with other active projects that already exist as part of the migration or target architecture? 0 = Yes 1 = No	• Eliminating redundancies in systems operations reduces cost and workload	• Departmental/OA Architectural Framework

Question	Guidance	Source Data
3. Does the project address §508 issues? 0 = No 1 = Yes	• Ensuring access to the system helps ensure its use and success.	• Departmental/OA Architectural Framework • Section 508 of the Federal Acquisition Regulations, Federal Register, April 2001 • Business Case
4. Does the project have an adequate security framework? 0 = No 1 = Yes	• Sound security frameworks ensure the prevention of data corruption or loss, system intrusion and the uninterrupted flow of business processes.	• Departmental/OA Architectural Framework • OMB Circular A-130, Management of Federal Information Resources • Business Case
5. Is the proposed system consistent with the organization's IT security standards?	• A system that is not in compliance with IT security standards will put the Department at risk to a loss of confidentiality, availability, and/or integrity of mission critical data.	• Business Case • OMB Circular A-130 • GISRA
6. Does the project use commercial-off-the-shelf technology (COTS) or Government off-the-shelf technology (GOTS)? 0 = The project does not use COTS or GOTS or will change or make modifications to the COTS/GOTS it plans to use 1 = The project fully uses COTS or GOTS without change or modification	• COTS or GOTS reduces the overall project risk.	• Business Case • Project Plan
Customer Satisfaction		

Question	Guidance	Source Data
1. Was a business process improvement analysis conducted prior to considering this project? 0 = No business process improvement analysis was conducted 1 = A business improvement analysis was conducted	• Processes have been simplified, improved or otherwise redesigned to reduce costs, improve effectiveness, etc.	• Performance Measures • Project Description
2. Are there performance measures and are they quantifiable? 0 = No 1 = Yes	• Performance measures identify that the project is meeting business needs and is improving business processes and satisfying customers	• Performance Measures • Cost/Benefit Analysis
Learning and Growth		
1. Were the results of post implementation reviews (PIRs) for the same or similar assets considered? 0 = The results of the same or similar PIRs were not considered. 1 = The results of the same or similar PIRs were considered from either DOT or similar Government or commercial organizations.	• Applying lessons learned from previous projects prevents the duplication of mistakes and increases efficiencies.	• Business Case • Post Implementation Reviews
2. Is there a specific plan for monitoring, managing and mitigating project risks? 0 = There is no risk management plan 1= A risk plan exists; however, the plan lacks mitigation measures for each of the identified risks 2 = A risk management plan exists that clearly identifies categories and factors with associated probability of occurrences, severity of impacts, priorities and mitigation strategies	• An Assessment and Management Plan identifies, analyzes, plans for, and reports risks that could affect the successful delivery of the project. The plan includes descriptions of the project's risks and the corresponding mitigating action.	• Risk Assessment and Management Plan

Control

Question	Guidance	Source Data
1. Cost Variance 0 = Cost variances are at or exceed ten percent 1 = Cost variance are at or exceed seven percent 2 = Cost variances are less than seven percent	• Cost variances greater than ten percent are reportable to OMB • Projects that exceed 10 percent cost variances generally improve by only a couple percentage points	• Financial Statements • Project Schedule
2. Schedule Variance 0 = Variances are at or exceed ten percent 1 = Variance are at or exceed seven percent 2 = Variances are less than seven percent	• Is a sound tool for deriving the expected completion date of the project based on current trends	• Project Schedule
3. Requests for Increases in Funding 0 = Additional funding has been requested that equals or exceeds ten percent of the project's total budget 1 = Additional funding has been requested 2 = No additional funding has been requested	• Requests for additional funding often reflect an ill-defined or requested increased in the project's scope, which increases the project's risks	• Request for Modification in Funding

Question	Guidance	Source Data
4. Performance Measures 0 = Performance measures have not been developed or the measures developed are not meeting expectations 1 = Performance measures are meeting 80 percent of expectations 2 = Performance measures are meeting all expectations	• Performance measures are indicators of whether projects are meeting intended goals	• Performance Measurement Baseline
5. Deliverables Quality 0 = No deliverables have met expectations 1 = 75 percent of deliverables have met expectations 2 = All deliverables have met expectations	• Is a formal means to ensure that product, deliverables and tasks are meeting expectations	• Deliverables Quality/Acceptance Report
6. Risk Assessment & Mitigation 0 = No risk assessment plan been developed or the plan is not comprehensive to address all risk areas 1 = A risk plan has been developed and has successfully helped mitigate 75 percent of all project risks 2 = The risk plan is comprehensive and the mitigation plan is successfully mitigating all risks	• A risk plan helps to focus efforts that need greater attention, increasing the likelihood that the project succeeds	• Risk Assessment & Mitigation Plan

Question	Guidance	Source Data
7. Architecture Framework 0 = The project does not comply with architecture standards, the course of the project has diverged from its intended framework, or the strategic goals of the Department/OA has redirected the framework 1 = The project is in compliance with the architecture framework	• The project, in most instances, must comply with the architecture in order to be successfully implemented and operational	• Architecture Framework • DOT Strategic Goals & Objectives

1.017.8 Appendix 8 – Example CIO Report

From: Chief Information Officer, Department of Transportation
To: Secretary, Department of Transportation
Via: Deputy Secretary, Department of Transportation
Copy: Heads of Operating Administrations, OST Office Directors

QUARTERLY SUMMARY OF INFORMATION TECHOLOGY PROJECTS

1. The performance of significant information technology-related projects in the Department of Transportation are summarized below, and a recommendation on the status of the projects is made after coordination with the sponsoring organization. ***(Actual project information is not used in this example report.)***

Project	Sponsor	Total Cost/ Cost to Date (EVM-Variance)	Schedule Issues (Variance)	Performance Issues (Variance)	Recommended For Further Action
Blue Horizon	USCG	$1.2 B $450M (-2%)	2 mos ahead	None	Continue
Oceanic Sectoring	FAA	$1.05B $220M (+1%)	On schedule	None	Continue*
Smart Highway	FHWA	$960M $865M (+4%)	4 mos behind due to weather at site	None	Continue
Global Rescue	USCG	$680M $525M (+23%)	9 mos behind due to Interop Issue	USAF/NATO Interoperability	Modify
DOT Net	TASC	$450M $320M (-2%)	2 mos behind due to equip shipping delay	Exceeding bandwidth & speed on 1st test	Continue
National Rail-Link	RRA	$300M $65M (+38%)	1 yr behind due to main contractor loss of key personnel	Rail-link Center design will not handle all equip	Terminate, then Rescope/Re- design and Re-Award
Common Desktop	TASC	$180M $42M (0)	1 month ahead in rollout of new application suite	Service Patch 2 will be required on Office 2000 clients	Continue

*Comments under "Recommended For Further Action" pertaining to FAA program disposition are subject to 49 U.S.C. 106, 4011, 40121.

2. Additional comments are as follow:

   a. Global Rescue. The USCG CIO intends to extend the current phase of this project to accommodate the additional time it will require to resolve technical interoperability issues of the Global Rescue satellite/UHF line-of site links with NATO and USAF, who will be the initial partners in coordinating global rescue operations using the new system. Impact to cost and performance is negligible. I recommend supporting this decision.

   b. National Rail-Link. The RRA IT Director intends to cancel the current contract with Acme Integrators, Inc. for non-performance. This is due to Acme's inability to replace the lead systems engineer in a timely manner, causing significant delay in the project, as well as a design problem in the capacity of the planned national Rail-link center to support the amount of equipment now envisioned. I recommend supporting this decision.

3. The DOT IRB held its quarterly meeting on February 4th, and the minutes are attached for your review. Of interest is the capital planning committee's project to hold training sessions in April on how to conduct project post-implementation reviews. This training will involve representatives from other government agencies and private industry and is open to all DOT organizations.

1.017.9 Appendix 9 – References

The Administration and Congress have extensively addressed the management of IT projects during the past decade. From sweeping reform legislation to detailed descriptions of best practices, the government has provided both requirements and suggestions on how to invest in and maintain an increasingly important IT infrastructure in each department and agency. Although this body of law and guidance lacks in cohesiveness and integration in some areas, it has served to improve coverage of critical IT oversight issues. These include establishing a Chief Information Officer (CIO) position in each department/agency listed in the Clinger-Cohen Act. Responsibilities include implementing an integrated architecture and capital planning processes, invoking the use of performance measures in project oversight and business processes, IT workforce planning, providing on-line transaction alternatives, and the improvement of IT security for all systems, the use of digital signatures, promoting the development of new "electronic-government" processes. Current IT-related law and guidance from the Federal government includes:

IT-Related Law:

- Computer Security Act of 1987
- Government Performance and Reform Act of 1993
- Federal Acquisition Streamlining Act of 1994
- Paperwork Reduction Act of 1995
- Clinger-Cohen Act of 1996

- Department of Transportation and Related Agencies Appropriations Act of 1996 (FAA's Acquisition Management System (AMS))
- Air Traffic Management System Performance Improvement Act of 1996
- Federal Acquisition Reform Act of 1996
- 1998 Amendments to the Disabilities Act (Section 508)
- Government Paperwork Elimination Act of 1998
- Government Information Security Reform Act of 2001

IT-Related Guidance:

- Executive Order 13011: Federal Information Technology
- OMB Circular A-11: Submission of Budgets, Strategic Plans & Annual Reports
- OMB Circular A-94: Guidelines for Cost/Benefit Analysis of Federal Programs
- OMB Circular A-130: Management of Federal Information Resources (December 2000)
- OMB Memo 96-02: Funding Information System Investments (Raines' Rules)
- OMB Memo 97-16: IT Architectures
- GAO/AIMD-94-115: Improving Mission Performance Through Information Mgmt. & Technology
- GAO/AIMD-98-89: Measuring Performance & Demonstrating Results of IT Investments
- GAO/AIMD-10.1.23: IT Investment Management (ITIM) Review Draft
- GAO/AIMD-00-260: IT Management. SBA Needs Policies/Procedures to Control Key IT Processes
- GAO/AIMD-00-282: Electronic Paperwork Elimination Act Presents Challenges for Agencies
- GAO/AIMD-00-316: Federal CIO. Leadership Needed to Confront Serious Challenges/New Issues
- GAO/AIMD-00-318: Maximizing the Effectiveness of Chief Information Officer Organizations
- Federal Acquisition Regulations (FAR)

The following internet sites are general sources where the above listed publiscations can be found:

Executive Orders http://www.nara.gov/fedreg/
OMB Circulars http://www.whitehouse.gov/omb/
GAO Documents http://www.gao.gov/
Federal Acquisition Regulation (FAR) http://www.arnet.gov/far

CPIC RESOURCES

There are a variety of requirements, guidance, and recommendations specifically relating to IT Investment Management. The Office of the Chief Information Officer recommends each

individual and organization involved in the CPIC process also become familiar with the following:

OMB Circular A-130
Management of Federal Information Resources
http://www.whitehouse.gov/omb/circulars/a130/a130trans4.html

GAO AIMD 10.1.23
Information Technology Investment Management, A Framework for Assessing and Improving Process Maturity
http://www.gao.gov/special.pubs/10_1_23.pdf

Federal CIO Council, Capital Planning and IT Management Committee and Industry Advisory Council
Smart Practices in Capital Planning
http://www.cio.gov/Documents/smart_practices_book.pdf

Attachment III
Department of Transportation
Enterprise Architecture Project Plan

U.S. Department of Transportation

Enterprise Architecture Planning

Project Plan

Updated August 23, 2002

Contract Number: DTTS59-00-D-00618
Task Order Number: T010001

Table of Contents

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1 Introduction

The Clinger/Cohen Act (CCA) and Office of Management and Budget (OMB) Circular A-130, Revised, "Management of Federal Information Systems," require Federal agencies to develop and maintain an Enterprise Architecture (EA). In order for the U.S. Department of Transportation (DOT) to meet this requirement, the DOT Chief Information Officer (CIO) has initiated an Enterprise Architecture Planning (EAP) Project. The objective of this project is to develop an enterprise architecture for the Department that will satisfy both legal and regulatory requirements for the development of an EA.

The EAP project is sponsored and managed day-to-day by the CIO's office, but it requires the regular involvement of personnel from across the Department, including personnel from each of the Department's Operating Administrations (OAs) and from the Office of the Secretary of Transportation (OST). To assist in the execution of the project, the Department has contracted with PricewaterhouseCoopers LLP (PwC). PwC will be involved day-to-day in the execution of the project and will work closely with the CIO EAP project team. The EAP project was started in January 2001. The effort is scheduled to progress in three phases, concluding in September 2003.

1.1 Scope Of This Document

This document presents an overall plan for execution of the three phases of the DOT Enterprise Architecture Planning Project. This includes:

- Providing a brief description of the approach and methodology that will be used for the project
- Outlining each of the major tasks for each phase
- Discussing the organization of the project team and the roles of the groups and individuals that comprise the team
- Presenting a timeline for each of the three project phases.

This document discusses various aspects of the Spewak EAP methodology for enterprise architecture planning, but only to the extent necessary to describe particular tasks. It is not intended to provide a tutorial on the Spewak methodology.

1.2 Assumptions

This document, and especially the workplan in Appendix B of this document, will not be static and will require periodic updates throughout the course of the project.

2 Approach and Methodology

The DOT EAP Project uses Dr. Steven H. Spewak's methodology for enterprise architecture planning. This EAP methodology was developed during the late 1980s and early 1990s and was eventually published in complete form as the book Enterprise Architecture Planning: Developing a Blueprint for Data, Applications and Technology. The methodology draws on the principles of the Zachman Framework, a framework for defining information systems architectures published by John Zachman in 1987, and it essentially provides a roadmap for completing the framework's first two levels. The Spewak methodology has been widely and successfully used in both industry and government. It is well documented, and training on the methodology is readily available from a number of sources. The methodology has been endorsed by the Federal CIO Council and serves as the basis for the CIO Council's Federal Enterprise Architecture Framework.

The Spewak methodology divides an EAP effort into seven distinct phases (these phases are different from the three-phase structure of this project): planning initiation, business modeling, current systems and technology, data architecture, applications architecture, technology architecture, and implementation/migration. The methodology then organizes the seven phases into four layers. Figure 2–1 depicts the seven phases in their layered organization. This depiction is often referred to as the Spewak "wedding cake."

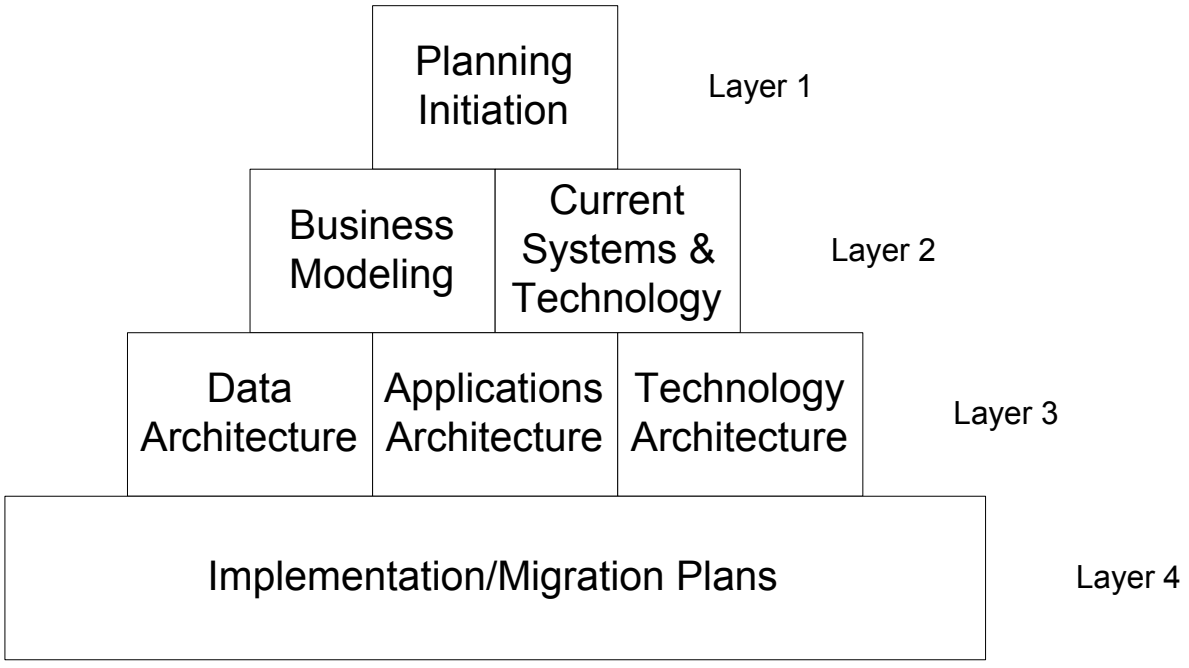


Figure 2–1 The Spewak "Wedding Cake"[1]

[1] *Steven H. Spewak and Steven C. Hill,* Enterprise Architecture Planning: Developing a Blueprint for Data Applications and Technology *(New York: John Wiley and Sons, 1993), 13.*

In the Spewak method, the first layer of the wedding cake provides for various project startup tasks like assembling the project team, developing guiding documents for EAP and gauging how ready the organization is for the EAP effort. Layer two of the wedding cake is essentially focused on collecting data on the current state of an enterprise's architecture and developing an "as-is" architecture. In layer three, "to-be" data, application and technology architectures are developed from the "as-is" architecture. Layer four focuses on the development of an implementation sequencing plan to guide transition of the architecture from the "as-is" state to the "to-be" state.

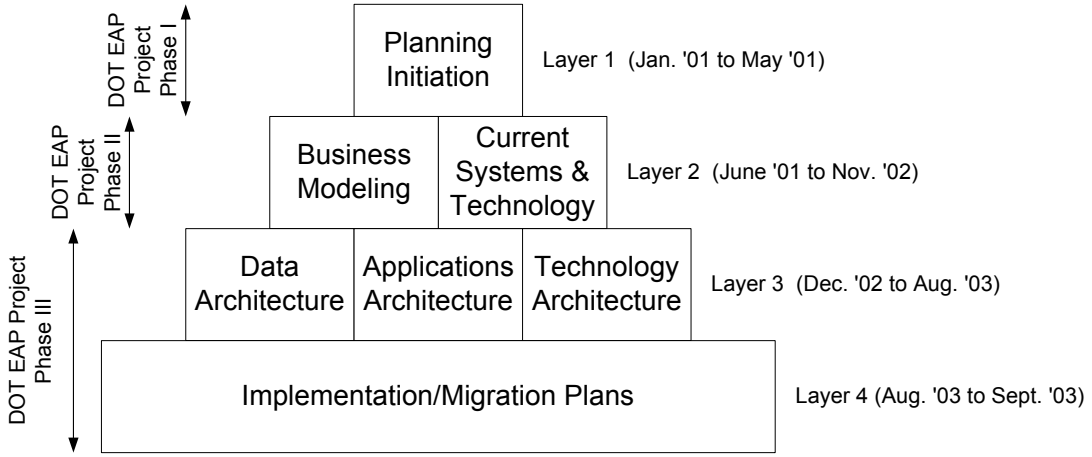


Figure 2–2 The Spewak Wedding Cake and Project Phases

The approach for executing the DOT EAP project is to complete layer 1 activities in the project's first phase. The project's second phase will complete layer two activities, and the third phase will complete activities in layers three and four. The major activities in each phase of the project are described in the remainder of section 0. A project schedule can be found in Appendix B.

2.1 Planning Initiation (Activity 1)

2.1.1 Assemble a Planning Team (Activity 1.1)

During this activity the enterprise architecture planning team is determined and organized. The team consists of the DOT CIO project team, the PwC consulting team, and the DOT CIO Council's Enterprise Architecture Committee. The members and roles of each of these groups will be determined. In addition, a charter outlining the role and operation of the enterprise architecture committee will be developed, and kickoff meetings involving the various groups will be conducted.

Results include:

- Enterprise architecture committee charter
- Briefing document for the initial enterprise architecture committee meeting.

2.1.2 Prepare EAP Project Plans (Activity 1.2)

This activity focuses on the development of project plans for the effort. A project plan will be developed for each phase of the project, with each new plan building on the previous plan. The project plans will provide a brief description of the approach and methodology to be used, outline major tasks, discuss the organization of the core project team, list expected deliverables, and present a schedule for activities in the form of a workplan (Gantt chart).

Results include:

- Phase I project plan, Phase II project plan and Phase III project plan
- Phase I workplan (Gantt chart), Phase II workplan and Phase III workplan.

2.1.3 Arrange for Tools and Computing Resources (Activity 1.3)

The enterprise architecture planning effort will require various tools and computing resources. This activity will focus on:

- Preparing an electronic work environment that provides basic collaborative work functions (e.g., document sharing)
- Researching and selecting EAP specific and more general tools to be used during the effort.

Results include:

- An electronic work environment
- Selected tools installed and ready for use.

2.1.4 Determine EAP Scope and Objectives (Activity 1.4)

This activity will work to develop a clear definition of the term "enterprise." Careful consideration will be given to identifying the proper scope for this EA effort. According to the Spewak methodology, a balance must be struck between developing a scope that is too narrow or too broad. Too narrow a scope and the architectures will be incomplete and lack detail from other business areas; too broad and there will not be enough time or resources to get sufficient detail in the architectures to make them useful for the design and construction of the systems. The scope and objectives will be articulated as part of the larger vision for the enterprise architecture.

Results include:

- Scope and objectives for the EA.

2.1.5 Create a Vision for the Enterprise Architecture (Activity 1.5)

This activity will focus on the development of a vision for the DOT EA. As part of this activity, internal documentation such as the DOT Strategic Plan will be gathered and reviewed. In

addition, data gathering on external experiences, visions, and best practices will be conducted. This information will be used to create a vision for the DOT EA.

Results include:

- Enterprise architecture vision document.

2.1.6 Assess Organizational Readiness (Activity 1.6)

This activity will include surveying a targeted population of OA business managers, Information Technology (IT) managers, and a representative cross section of EA stakeholders. The survey will identify both areas of commitment and obstacles that will need to be addressed to ensure a successful EAP project outcome.

Results include:

- Readiness survey
- Survey results and analysis.

2.1.7 Formulate Principles for IT Management (Activity 1.7)

Principles for IT management provide the ground rules for what information and technology management should and should not do. The purpose of these principles is to guide the decision making process for IT architectures and planning. Principles should be understandable, enduring, and independent of technology platforms and current products. This activity will focus on the development of principles for DOT.

Results include:

- Principles for IT management document.

2.1.8 Adapt an EAP Methodology (Activity 1.8)

As stated at the beginning of this section, the DOT EAP initiative will use the Spewak methodology for enterprise architecture planning. The methodology, however, will be tailored to meet the specific needs, schedule, and resources of the DOT effort. This activity will focus on tailoring the Spewak methodology to suit the DOT EAP effort. Initially, tailoring of the methodology will focus on those parts of the methodology that relate to Phase I. Towards the end of Phase I, work on tailoring those parts of the methodology related to Phases II and III will be done.

Results include:

- Crosswalk of Phase I activities to Spewak methodology activities
- Crosswalk of Phase II and III activities to Spewak methodology activities.

2.2 Develop "As-Is" Enterprise Architecture (Activity 2)

The "as-is" EA will be developed through a series of data gathering workshops conducted with the business and technology leaders from each OA. In terms of the Spewak method, this data collection effort can be thought of as the enterprise survey activity, and developing the "as-is" architecture corresponds to developing an enterprise business model and Information Resources Catalog (IRC) to reflect the current state of the organization's EA. Business modeling activities will be started in Phase I but will not be completed until Phase II of the project.

2.2.1 Prepare for Data Gathering (Activity 2.1)

The approach and method for data gathering will be developed. Specific data items to gather will be decided upon. Materials to support the data collection effort will be developed. This will include briefing materials on the data collection effort, data collection forms and instructions for the forms.

Results include:

- Briefing on data collection
- Blank data collection forms with instructions.

2.2.2 Develop Preliminary Business Model (Activity 2.2)

The preliminary business model will consist of a preliminary organizational structure and list of crosscutting business processes for each mode. The preliminary business model will be developed from existing information available to the EA project team. The preliminary data model will provide guidance for planning data collection activities in each mode.

Results include:

- Preliminary organizational structure for each mode
- Preliminary list of crosscutting business processes for each mode.

2.2.3 Collect "As-Is" Data (Activity 2.3)

Process, data, application and technology data will be collected for crosscutting business processes in each mode. The data collection forms developed in activity 2.1 will be used as the primary means for data collection, but data may also be captured through interviews, informal conversations or email.

Results include:

- Raw data for "as-is" EA.

2.2.4 Prepare "As-Is" EA (Activity 2.4)

The "as-is" architecture will be prepared by entering the raw data into the EA tool, with limited revision after initial entry to improve accuracy and completeness. From the tool, components of the "as-is" architecture will be generated in electronic form. The "as-is" architecture will be published on the DOT intranet and reviewed with the DOT CIO Council and the Council's EA Committee.

Results include:

- "As-is" EA in electronic form.

2.3 Develop "To-Be" Enterprise Architecture (Activity 3)

The "as-is" model will be analyzed to develop the "to-be" enterprise architecture. The analysis will make use of the various features of the EA tool as well as some supplemental tools developed for the EA.

2.3.1 Develop "To-be" Business Model (Activity 3.1)

The "as-is" business model will be analyzed. Based on the analysis, a "to-be" business model will be developed.

Results include:

- "To-be" business model.

2.3.2 Develop "To-be" Data Architecture (Activity 3.2)

The "as-is" data architecture will be analyzed. Based on the analysis, a "to-be" data architecture will be developed.

Results include:

- "To-be" data architecture.

2.3.3 Develop "To-be" Application Architecture (Activity 3.3)

The "as-is" application architecture will be analyzed. Based on the analysis, a "to-be" applications architecture will be developed.

Results include:

- "To-be" application architecture.

2.3.4 Develop "To-be" Technology Architecture (Activity 3.4)

The "as-is" technology architecture will be analyzed. Based on the analysis, a "to-be" technology architecture will be developed. This will include a Technical Reference Model (TRM) with standards profile.

Results include:

- "To-be" technology architecture.

2.3.5 Review and Validate "To-Be" Enterprise Architecture

The "to-be" enterprise architecture will be reviewed with the DOT CIO Council and the Council's EA Committee. The architecture will be revised as necessary based on the results of the review.

Results include:

- Validated "to-be" enterprise architecture.

2.4 Develop Implementation Sequencing Plan (Activity 4)

A set of suggested project initiatives for migrating the enterprise architecture from the "as-is" state to the "to-be" state will be developed. Working with the CIO Council and the EA Committee, these initiatives will be prioritized. An implementation sequencing plan summarizing the initiatives and discussing the prioritization of the initiatives will be developed.

- Implementation sequencing plan.

3 Project Team

The DOT EAP Project is sponsored by the DOT CIO's office. Successful project execution, however, will require the involvement of a number of people from many areas within the Department. This will include:

- Executive sponsorship of the project at the Secretary, Deputy Secretary, and CIO level
- Oversight and approval by the DOT CIO Council
- Regular involvement of business and IT experts from the OAs and OST who understand the Department's business functions and the role of the Department's various IT systems.

Overall project management and execution will be the responsibility of the CIO's office. The CIO's office has provided a dedicated project manager, a project team, and has engaged PwC to provide consulting staff in support of the effort. Regular involvement of business and IT experts from each operating administration has been assured by the DOT CIO Council through the

organization of the enterprise architecture committee. Figure 3–1 depicts the overall organization of the EAP project.

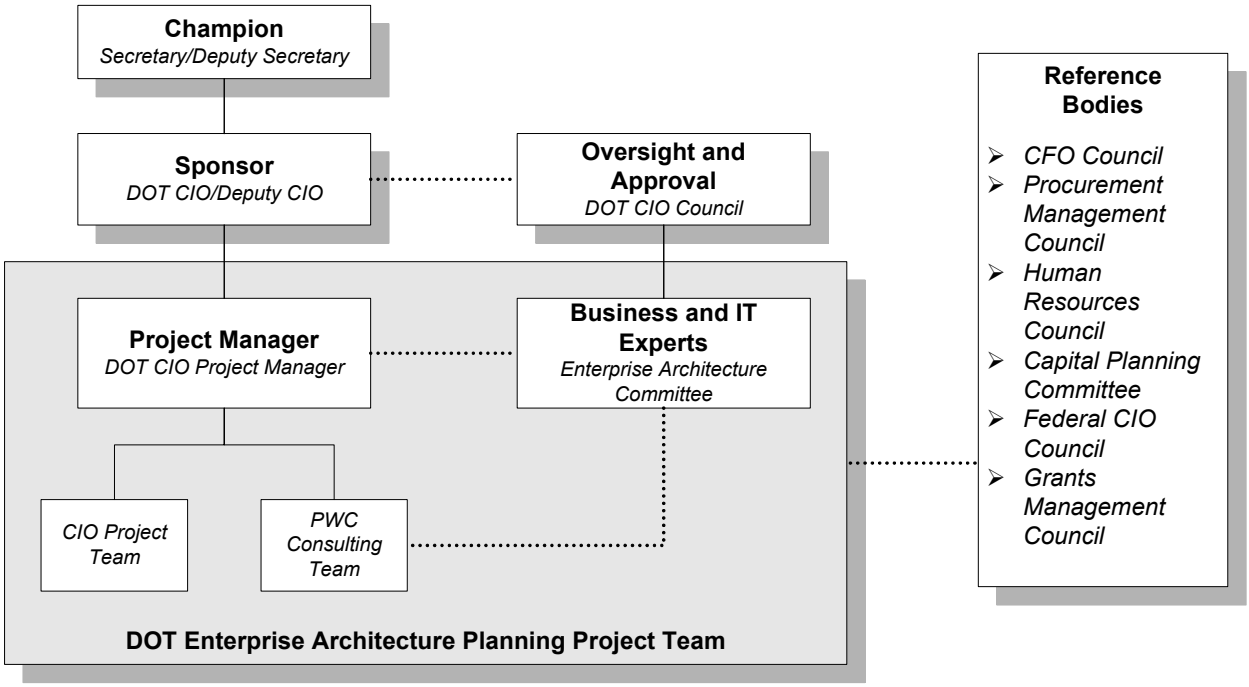


Figure 3–1 DOT EAP Project Organization

3.1 DOT CIO Project Manager

Overall day-to-day project management and execution is the responsibility of the DOT CIO Project Manager. The project manager is a member of the CIO organization. The project manager will have direct oversight of the CIO project team and will direct the PwC consulting team via appropriate PwC management channels.

3.2 Enterprise Architecture Committee

The enterprise architecture committee is the primary source of business and IT experts for the EAP project team. The committee is sanctioned by the DOT CIO Council and is comprised of members from each OA and the OST. Committee members will serve as the primary liaison from their organization for the EAP effort. Members of the committee are expected to be a central source for information gathering and dissemination. A committee charter governs organization of the committee. The committee is headed by a committee chair who will work closely with the project manager, core CIO team and the consulting staff. The committee chair is also responsible for presenting findings and making recommendations to the CIO Council.

3.3 PwC Consulting Team

The PwC consulting team will work closely with the DOT CIO project manager and core project team to develop the DOT EA and implementation plan. The PwC team will also work to promote EA knowledge sharing and provide best practices. PwC consultants will work day-to-day with the CIO project manager and team, and with the EA committee chair and members, as necessary. The PwC team will include a project partner and project manager, responsible for overall project management and service delivery, and an onsite team. Composition of the onsite team will vary depending on the needs and phase of the project, consisting of a mix of EAP experts, architects, business process experts and other Subject Matter Experts (SMEs).

3.4 Other Participants

The EA Project Team is supported by:

- A Champion, who is responsible for providing executive level support to the EA planning effort. The DOT Secretary/Deputy Secretary will be the champions for this EA planning effort.
- A Sponsor, who is responsible for the overall execution and success of the planning effort. The DOT CIO is the sponsor for this project.
- An Oversight and Approval Authority, who is responsible for overseeing the EA Committee's progress and approving key deliverables. The DOT CIO Council is the oversight and approval authority for this project
- The reference bodies are various standing bodies usually focused on a specific business area. These bodies are excellent sources of information on business processes and will be consulted during the development phase of the "to-be" architecture.

4 Schedule and Work Products

The Enterprise Architecture Planning project is scheduled to run from January 2001 through September 2003. The project has been divided into three phases. Table 4-1 shows each phase, its focus and duration. A Gantt chart for the project activities can be found in Appendix B, providing more detail for the activities in these phases.

Table 4–1 Phases of the DOT EAP Project

Phase	Focus	Duration
Phase I	• Complete Spewak phase 1	• January 2001 – May 2001
Phase II	• Complete Spewak phase 2, 3	• June 2001 – November 2002
Phase III	• Complete Spewak phase 4, 5, 6 and 7	• December 2002 – September 2003

A list of work products expected to be developed during the project can be found below in Table 4–2. The list focuses on document work products but may also include deliverables that are not

just documents. For example, activity 1.3 Arrange for Tools and Computing Resources, will result in delivery of a set of installed and configured tools, but is not expected to result in the development of any documents.

Some of these work products will be delivered formally to the Department to satisfy requirements for contract deliverables.

Table 4–2 Work Products

DOT Activity #	DOT Activity Name	Work Product
	Management and Reporting	• EA Committee meeting briefings • Management Council briefings
1	Planning initiation	
1.1	Assemble planning team	• Briefing for first enterprise architecture committee meeting • Enterprise architecture committee charter
1.2	Prepare EAP project plans	
1.2.1	Prepare EAP Phase I project plan	• EAP Phase I project plan
1.2.2	Prepare EAP Phase II project plan	• Project Plan – Phases I and II
1.2.3	Prepare EAP Phase III project plan	• Project plan for all three phases of the project
1.3	Arrange for tools and computing resources	• Installed and configured set of tools
1.4	Determine EAP scope and objectives	• Included in the EA vision document
1.5	Create an EA vision	• EA vision document
1.6	Assess organizational readiness	• Readiness survey • Survey results and analysis
1.7	Formulate principles for IT management	• Principles document
1.8	Adapt an EAP methodology	• Phase I Project Plan, Appendix B
2	Develop “As-is” Enterprise Architecture	• Preliminary organization charts • Preliminary list of crosscutting business processes • Data collection forms set • Completed data collection forms • Tutorial briefing • Current organization, process, application, data and technology architecture captured in the tool set
3	Develop “To-be” Enterprise Architecture”	• ”To-be” enterprise architecture
4	Develop Implementation Sequencing Plan	• Implementation sequencing plan

APPENDIX A: ACRONYM LIST

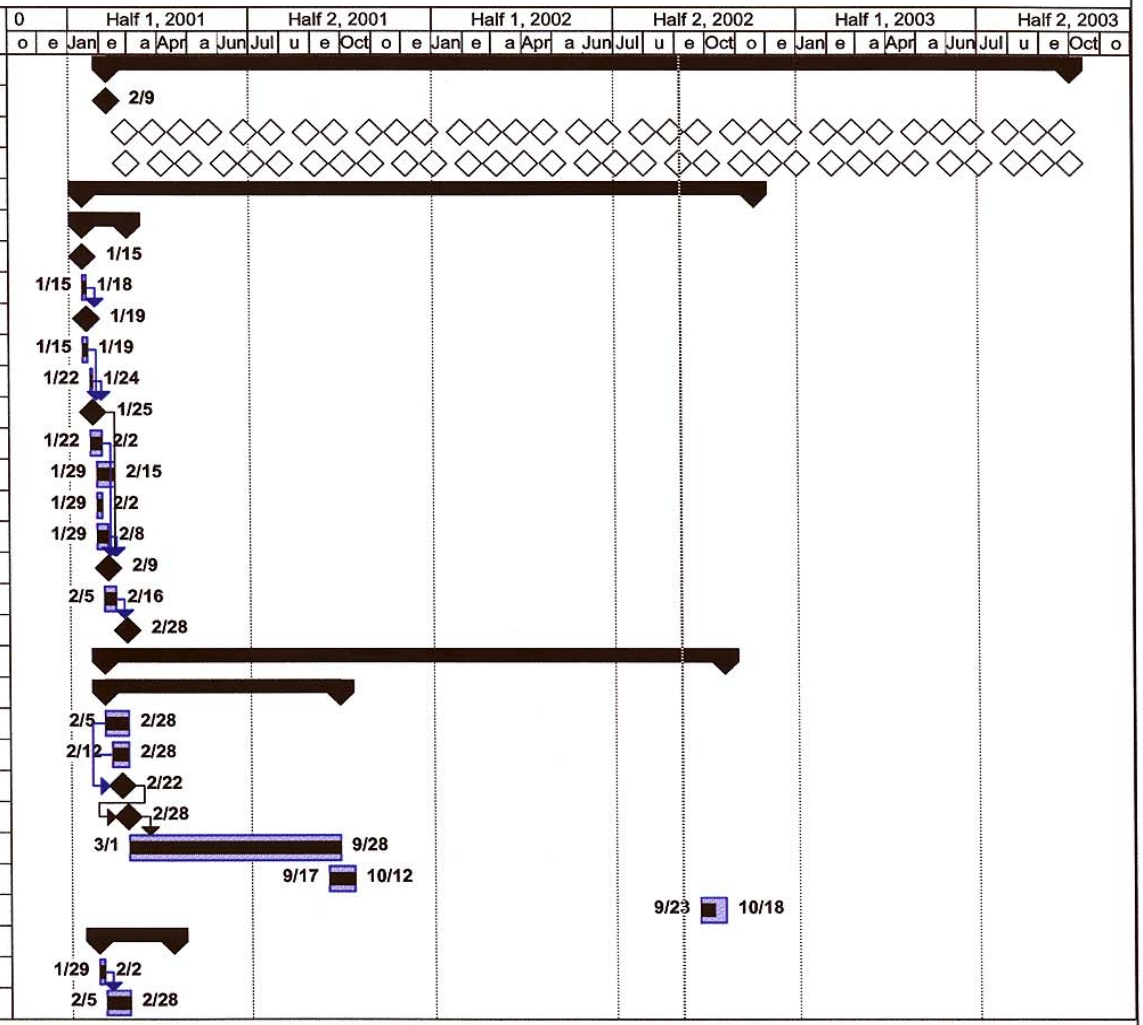
Table A–1 Acronym List

Acronym	Definition
CCA	Clinger/Cohen Act
CIO	Chief Information Officer
DOT	U.S. Department of Transportation
EA	Enterprise Architecture
EAP	Enterprise Architecture Planning
IRC	Information Resources Catalog
IT	Information TechnologyInformation Technology
OA	Operating Administration
OMB	Office of Management and Budget
OST	Office of the Secretary of Transportation
PwC	PricewaterhouseCoopers LLP
SME	Subject Matter Expert
TRM	Technical Reference Model

APPENDIX B: EA WORKPLAN

DOT EAP Workplan

ID	Task Name
1	**Management and Reporting**
2	EA Committee Kickoff Meeting
3	**EA Committee Meetings**
36	**CIO Council Meeting**
69	**Planning Initiation (Activity 1)**
70	**Assemble planning team (Activity 1.1)**
71	DOT CIO EAP Project Team finalized
72	Assemble contractor team
73	Kickoff meeting with PwC
74	Select EA Committee Chair
75	Prepare briefing for EA Committee Chair
76	Kickoff meeting with EA Committee Chair
77	Determine EA Committee membership
78	Define project team organization, roles and responsibilities
79	Prepare draft EA committee charter
80	Prepare 1st EA Committee meeting briefing
81	Hold 1st EA Committee meeting
82	Receive comments on draft charter
83	EA Committee charter finalized
84	**Prepare EAP Project Plans (Activity 1.2)**
85	**Prepare EAP phase I project plan (Activity 1.2.1)**
86	Prepare initial Gantt chart
87	Prepare initial project plan document
88	Brief EA Committee Chair on phase I project plan
89	Present phase I project plan to EA Committee
90	Maintain phase I project plan
91	Prepare EAP Phase II project plan (Activity 1.2.2)
92	Prepare EAP Phase III project plan (Activity 1.2.3)
93	**Arrange for tools and computing resources (Activity 1.3)**
94	Decide on electronic work environment
95	Prepare shared electronic work environment (DOTNet)

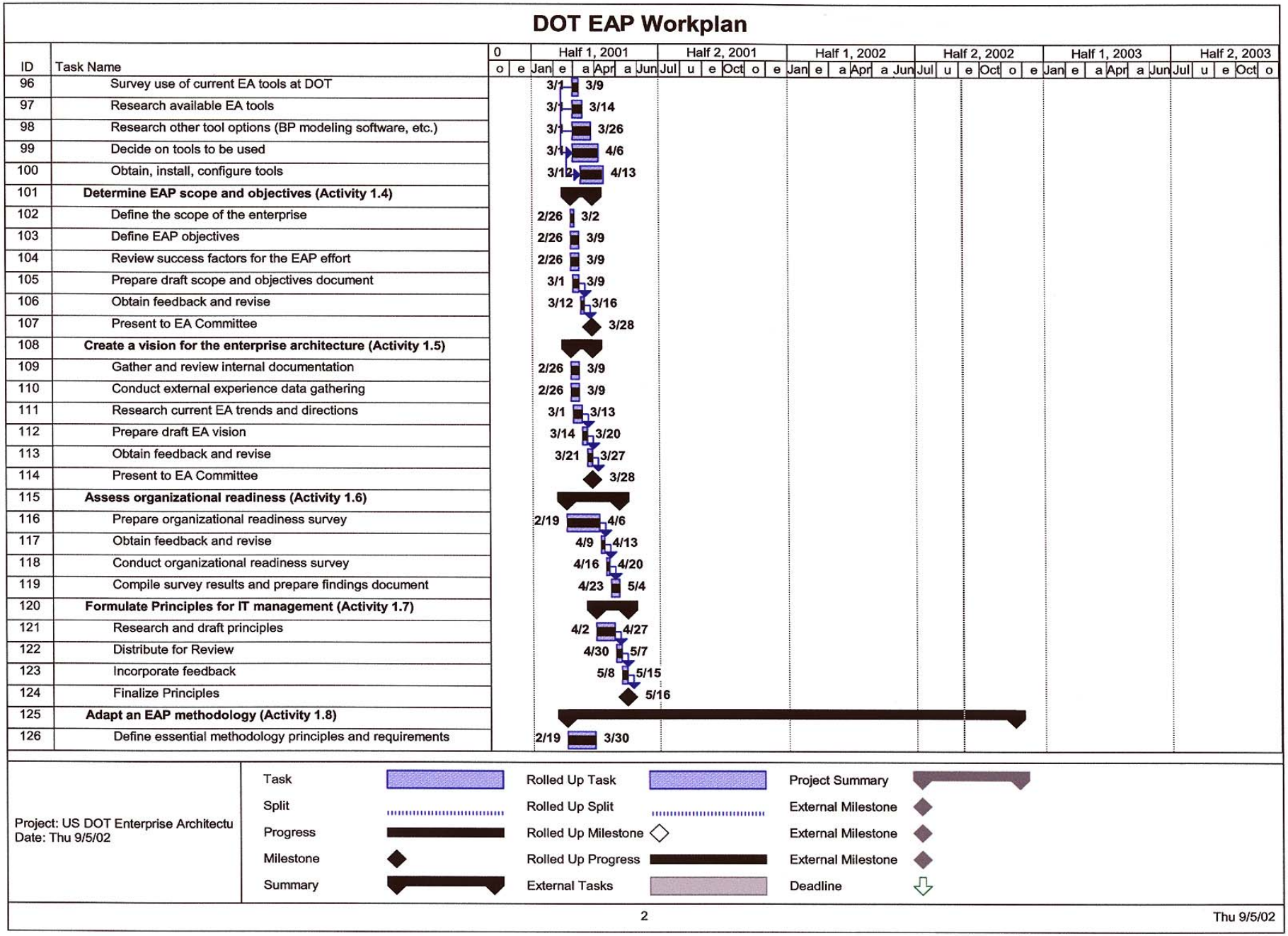


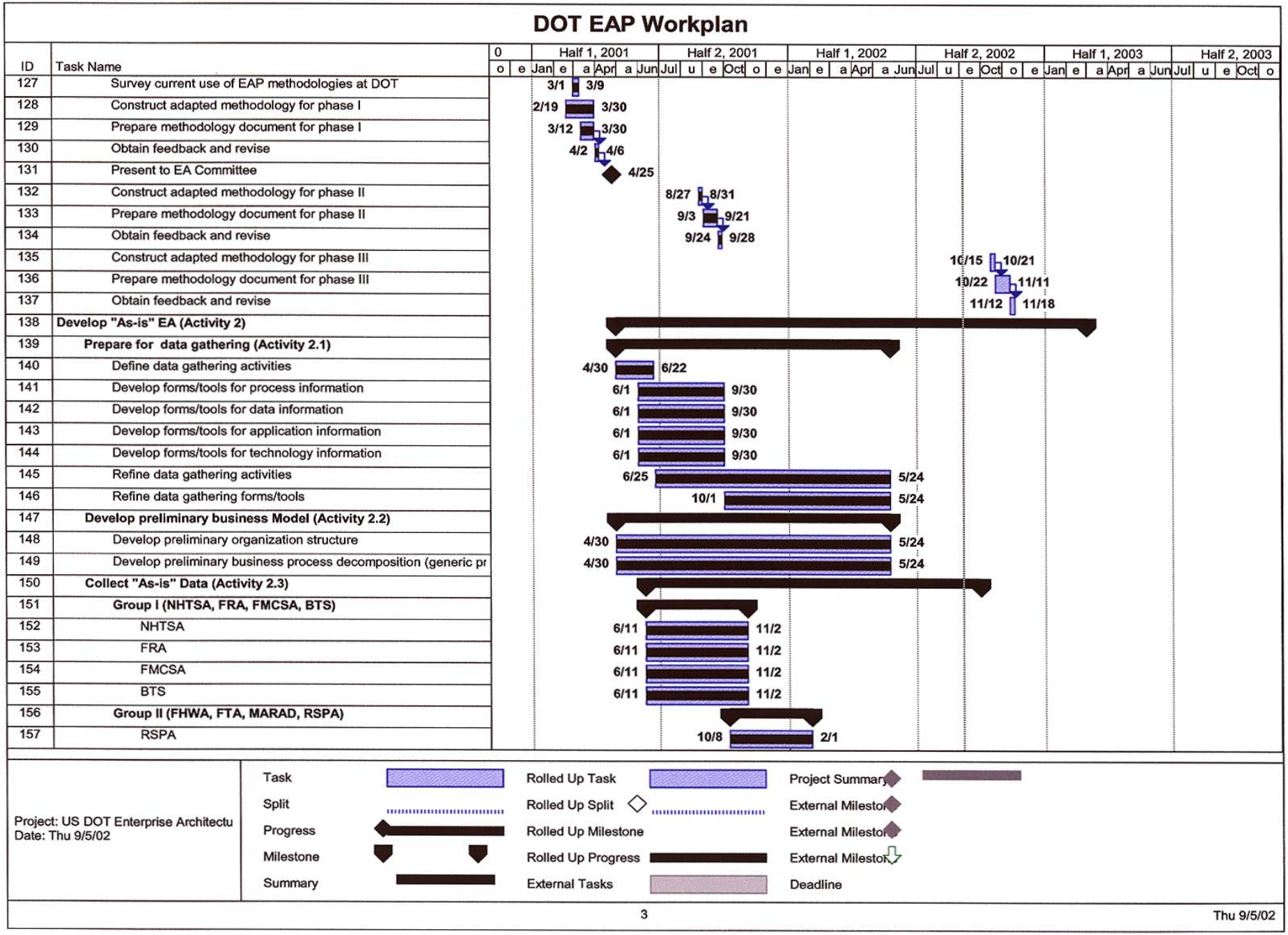
Project: US DOT Enterprise Architectu
Date: Thu 9/5/02

Task		Rolled Up Task		Project Summary	
Split		Rolled Up Split		External Milestone	
Progress		Rolled Up Milestone		External Milestone	
Milestone		Rolled Up Progress		External Milestone	
Summary		External Tasks		Deadline	

1

Thu 9/5/02


DOT EAP Workplan
ID
Task Name
Half 1, 2001
Half 2, 2001
Half 1, 2002
Half 2, 2002
Half 1, 2003
Half 2, 2003
96 Survey use of current EA tools at DOT
97 Research available EA tools
98 Research other tool options (BP modeling software, etc.)
99 Decide on tools to be used
100 Obtain, install, configure tools
101 Determine EAP scope and objectives (Activity 1.4)
102 Define the scope of the enterprise
103 Define EAP objectives
104 Review success factors for the EAP effort
105 Prepare draft scope and objectives document
106 Obtain feedback and revise
107 Present to EA Committee
108 Create a vision for the enterprise architecture (Activity 1.5)
109 Gather and review internal documentation
110 Conduct external experience data gathering
111 Research current EA trends and directions
112 Prepare draft EA vision
113 Obtain feedback and revise
114 Present to EA Committee
115 Assess organizational readiness (Activity 1.6)
116 Prepare organizational readiness survey
117 Obtain feedback and revise
118 Conduct organizational readiness survey
119 Compile survey results and prepare findings document
120 Formulate Principles for IT management (Activity 1.7)
121 Research and draft principles
122 Distribute for Review
123 Incorporate feedback
124 Finalize Principles
125 Adapt an EAP methodology (Activity 1.8)
126 Define essential methodology principles and requirements
Project: US DOT Enterprise Architectu
Date: Thu 9/5/02
Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
External Milestone
External Milestone
Deadline
2
Thu 9/5/02


DOT EAP Workplan
ID
Task Name
Half 1, 2001
Half 2, 2001
Half 1, 2002
Half 2, 2002
Half 1, 2003
Half 2, 2003
127 Survey current use of EAP methodologies at DOT
128 Construct adapted methodology for phase I
129 Prepare methodology document for phase I
130 Obtain feedback and revise
131 Present to EA Committee
132 Construct adapted methodology for phase II
133 Prepare methodology document for phase II
134 Obtain feedback and revise
135 Construct adapted methodology for phase III
136 Prepare methodology document for phase III
137 Obtain feedback and revise
138 Develop "As-is" EA (Activity 2)
139 Prepare for data gathering (Activity 2.1)
140 Define data gathering activities
141 Develop forms/tools for process information
142 Develop forms/tools for data information
143 Develop forms/tools for application information
144 Develop forms/tools for technology information
145 Refine data gathering activities
146 Refine data gathering forms/tools
147 Develop preliminary business Model (Activity 2.2)
148 Develop preliminary organization structure
149 Develop preliminary business process decomposition (generic pr
150 Collect "As-is" Data (Activity 2.3)
151 Group I (NHTSA, FRA, FMCSA, BTS)
152 NHTSA
153 FRA
154 FMCSA
155 BTS
156 Group II (FHWA, FTA, MARAD, RSPA)
157 RSPA
Project: US DOT Enterprise Architectu
Date: Thu 9/5/02
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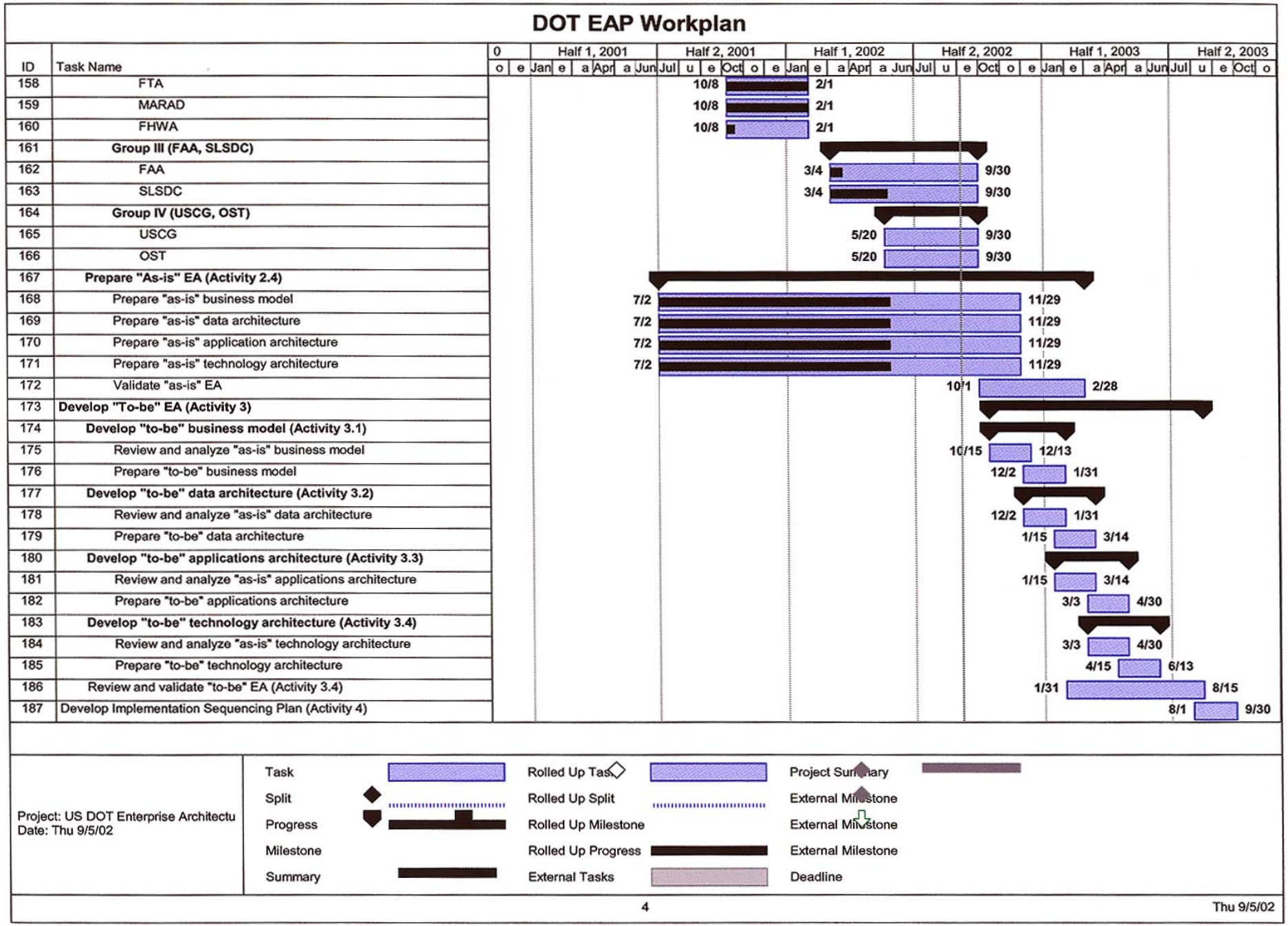
DOT EAP Workplan
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Half 1, 2001
Half 2, 2001
Half 1, 2002
Half 2, 2002
Half 1, 2003
Half 2, 2003
158 FTA
159 MARAD
160 FHWA
161 Group III (FAA, SLSDC)
162 FAA
163 SLSDC
164 Group IV (USCG, OST)
165 USCG
166 OST
167 Prepare "As-is" EA (Activity 2.4)
168 Prepare "as-is" business model
169 Prepare "as-is" data architecture
170 Prepare "as-is" application architecture
171 Prepare "as-is" technology architecture
172 Validate "as-is" EA
173 Develop "To-be" EA (Activity 3)
174 Develop "to-be" business model (Activity 3.1)
175 Review and analyze "as-is" business model
176 Prepare "to-be" business model
177 Develop "to-be" data architecture (Activity 3.2)
178 Review and analyze "as-is" data architecture
179 Prepare "to-be" data architecture
180 Develop "to-be" applications architecture (Activity 3.3)
181 Review and analyze "as-is" applications architecture
182 Prepare "to-be" applications architecture
183 Develop "to-be" technology architecture (Activity 3.4)
184 Review and analyze "as-is" technology architecture
185 Prepare "to-be" technology architecture
186 Review and validate "to-be" EA (Activity 3.4)
187 Develop Implementation Sequencing Plan (Activity 4)
Project: US DOT Enterprise Architectu
Date: Thu 9/5/02
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External Tasks
Project Summary
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Deadline
4
Thu 9/5/02

Attachment IV
Federal Aviation Administration
National Airspace System (NAS) Architecture

U.S. Department of Transportation
Federal Aviation Administration

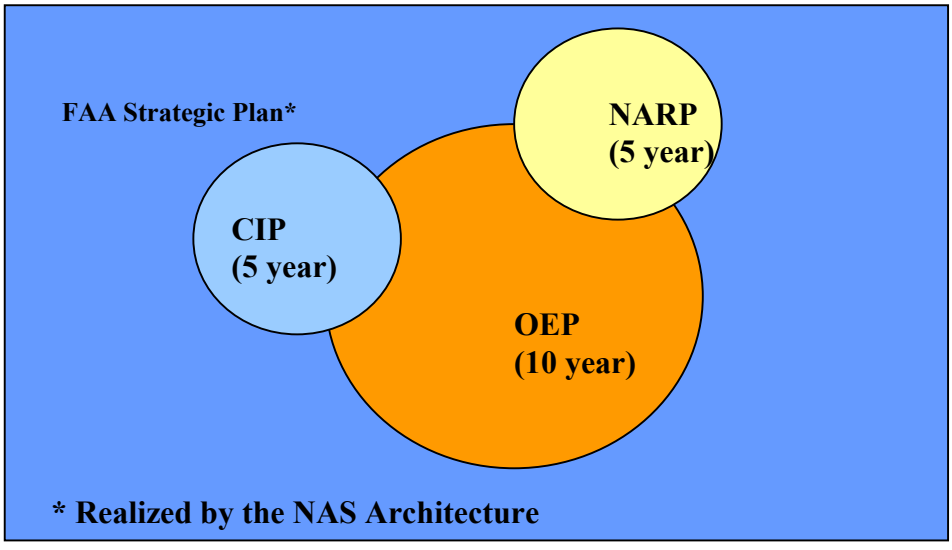
National Airspace System (NAS) Architecture

Summary

The NAS Architecture represents the FAA's strategic projection of the types of enabling mechanisms (people, support activities, and systems) that are necessary to meet the needs of the aviation community. This projection is based primarily on the need to sustain existing NAS Services and then to provide incremental enhancements to those services. NAS Services are accomplished through the interaction of people and support activities with systems. The definition of these enabling mechanisms over time, form the basis of the NAS Architecture. The NAS Architecture includes the mechanisms (both internal and external to the FAA) that are necessary to provide NAS Services.

The NAS Architecture Data is divided into programmatic (i.e. cost and schedule) and technical (i.e. concepts, services, capabilities, implementation steps, requirements, and enabling mechanisms) components that are combined to define the enabling mechanisms necessary to meet the FAA mission and to deliver desired aviation services to the aviation community and aviation service providers.

The NAS Architecture, the FAA's Strategic Plan, the NAS Operational Evolution Plan (OEP), the Capital Investment Plan, and the National Aviation Research Plan (NARP): are key NAS modernization plans. Closely linked, each serves a specific purpose. The NAS Architecture is the agency's plan for modernization, supporting safety, security, and system efficiency goals. This plan establishes objectives and strategies for each goal and identifies related projects. The Architecture includes projections of all expenditures, including research, operations, facilities and equipment (F&E), and user investment. The FAA Strategic Plan, realized by the NAS Architecture, details FAA goals, establishes objectives and strategies for each, and identifies related projects. The OEP is the agency's commitment to the aviation industry for the next 10 years, addressing capacity and demand issues. The OEP is a subset and refinement of the Architecture that extends 10 years, includes all expenditures and has moved from funding projection to commitment. The CIP is the agency's 5-year F&E plan linked to FAA performance goals. The NARP describes FAA research plans, including those in partnership with other government agencies and private resources, for a 5-year period. These plans are consistent; they complement each other with increasing levels of detail relating to execution of FAA commitments. They ensure a well-planned modernization effort that balances FAA resources to maximize aviation community benefits. The Figure below summarizes the relationship of the documents.



The FAA Strategic Plan

The FAA Strategic Plan, released in January 2001, details goals largely centered in the areas of safety, security, and system efficiency. The NAS Architecture translates Strategic Plan goals and objectives into systems and procedures needed to modernize the NAS and achieve the FAA mission.

The NAS Operational Evolution Plan (OEP)

The OEP is a 10-year plan for operational improvements to increase capacity and efficiency in U.S. air travel and transport and other use of domestic airspace. The OEP is the FAA commitment to operational improvements. It is outcome driven, with clear lines of accountability within FAA organizations. The OEP concentrates on operational solutions and integrates safety, certification, procedures, staffing, equipment, avionics, and research.

The National Airspace System Capital Investment Plan (CIP)

The CIP aligns the NAS Architecture to the Office of Management and Budget: 5-year budget planning guidance and funding. Mandated by Congress, the CIP is updated annually. The CIP defines program goals, funding, and capitalization products to sustain current services, improve safety, and expand the NAS consistent with aviation's growth.

The National Aviation Research Plan (NARP)

The NARP, a 5-year plan, provides insight into FAA research activities and their relationship to the agency's mission and goals. Current-year program descriptions and accompanying high-level schedules are grouped in the 2002 NARP according to the FAA goal structure and R&D mission support needs. The FAA R&D program finds and prepares to field technologies, systems, designs, and procedures that directly support the agency's principal operational and regulatory responsibilities.

Other Documents

The System Safety Handbook: is used by FAA employees, supporting contractors, and other entities involved in applying system safety policies and procedures throughout the FAA. As the Federal agency with primary responsibility for aviation safety, the FAA develops and applies safety techniques and procedures in a wide range of activities from NAS modernization to ATC and aircraft certification. The System Safety Handbook defines procedures to be used in safety analysis and development of requirements for capabilities and implementation steps defined in the NAS Architecture.

The Aviation Capacity Enhancement Plan: is an annual review of efforts to improve the capacity of the national air transportation system by focusing on the top 100 airports, ranked by enplanements. The Airport Capacity Benchmark Report: contains capacity benchmarks for 31 of

the nation's busiest airports to help the FAA understand capacity and demand problems and solutions and to set metrics for the OEP and air traffic performance.

Accessing the Architecture

The Capability and Architecture Tool Suite (CATS), is an interactive web browser interface that provides access to the programmatic and technical data of the National Airspace System (NAS) Architecture. The NAS Architecture Data Base contains the FAA's information for modernizing the NAS. The Intranet version of CATS is intended to be a desktop reference of NAS Architecture data for all personnel that have access to the FAA Wide Area Network Backbone. The information presented reflects FAA decisions, work in progress with the aviation user community, alignment of projects to the FAA budget, and forecasted out-year-life-cycle costs, schedules, and interdependencies for delivery of services and capabilities.
The Intranet version of the NAS Architecture Data Base is the repository of cost, schedule, and technical data that supports the FAA plan for NAS Modernization. Reference documents and active web links within CATS describe plans and programs such as the Blueprint for NAS Modernization, the Operational Evolution Plan (OEP), Safer Skies, and Safe Flight 21 programs. CATS provides all users quick access to vast amounts of information associated with modernization of the NAS, which is critical to the assessment of future changes. Internal to the FAA, the Intranet version of CATS provides FAA personnel with an interface to the NAS Architecture Data Base that can aid in supporting Concept Evaluation, Mission Need Assessment, Investment Analysis, Investment Decision, and NAS level Impact Assessment tasks in support of the FAA's Strategic Goals and NAS Modernization. Personnel external to the FAA Wide Area Network Backbone can view the FAA's integrated long-range plan for the NAS, which draws on new technologies and a dedicated aviation community workforce to meet the increasing demands on our national air transportation system. The NAS Architecture also deals with the realities of ever-expanding aviation travel and commerce and the realities of fiscal constraints.